2.09 - Democracy Suite® ImageCast® X System Maintenance Manual

Version: 5.17-CO::4

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CHAPTER 1: INTRODUCTION

This chapter provides the following information, which includes a concept of operations that fully describes such items as the following, as specified in paragraph 2.9.1 of the VVSG 1.0 Volume II.

- Electrical and Mechanical Functions
- Ballot Handling and Reading
- Vote Selection and Casting of Ballot
- Transmission of Data over Network
- Handling of Data in Processor and Memory Units
- Initiation and Control of Data Output
- Acquisition and Use of Test and Diagnostic Information

1.1 Relevant Disclaimers

This document may make reference to certain Democracy Suite® functionalities that are not part of the current 5.17-CO campaign and should be disregarded throughout the document.

For a full list of relevant disclaimers, please see the "Relevant Disclaimers" section in the *2.02 - Democracy Suite® System Overview* document.

1.2 Electrical and Mechanical Functions

This sub-chapter describes the electrical and mechanical functions of the equipment, as specified in paragraph 2.9.1 of the VVSG 1.0 Volume II, item a.

The ImageCast® X operates as Ballot Marking Device. It is based on COTS parts that include:

- Android device
- Laser printer
- Smart Card Writer/Reader

Optional components: ATI

Interactive accessibility is enabled with additional third-party components. Accessible voting is provided by an ATI device and additional accessories:

- Four-switch accessible device - joystick
- Two-switch accessible devices - paddles or sips & puff In addition, a headset is included for audio voting sessions.

1.3 Ballot Handling and Reading

This sub-chapter describes how the processes of ballot handling and reading are performed, as specified in paragraph 2.9.1 of the VVSG 1.0 Volume II, item b.

This does not apply to the ImageCast® X ballot marking device platform.

1.4 Vote Selection and Casting of Ballot

This sub-chapter describes how vote selection and casting of the ballot are performed, as specified in paragraph 2.9.1 of the VVSG 1.0 Volume II, item c.

Vote selection is done by allowing the voter to select voting options using a touch-based interface on the touch-screen of the tablet.

Accessible voting is provided by allowing a voter to listen and/or view the voting options and select their choices using a combination of accessible devices.

Once a voter has finished making their selections, a laser printer produces a ballot that is handled as all other paper ballots.

1.5 Transmission of Data over Network

This sub-chapter describes how transmission of data over a network is performed, as specified in paragraph 2.9.1 of the VVSG 1.0 Volume II, item d.

Currently, there is no transmission of data over a network.

1.6 Handling of Data in Processor and Memory Units

This sub-chapter describes how data is handled in the processor and memory units, as specified in paragraph 2.9.1 of the VVSG 1.0 Volume II, item e.

Currently, no results data is stored on the system.

1.7 Initiation and Control of Data Output

This sub-chapter provides the following information for how data output is initiated and controlled, as specified in paragraph 2.9.1 of the VVSG 1.0 Volume II, item f:

Results data is not stored in the system. It is producing marked paper ballots.

1.8 Acquisition and Use of Test and Diagnostic Information

This sub-chapter describes how test and diagnostic information is acquired and used, as specified in paragraph 2.9.1 of the VVSG 1.0 Volume II, item h.

The ImageCast® X System is based on COTS modules. All Test and the Diagnostic information are provided by components vendors.

CHAPTER 2: MAINTENANCE PROCEDURES

- Preventative Maintenance Procedures
- Corrective Maintenance Procedures

2.1 Preventative Maintenance Procedures

This chapter defines the following Preventative Maintenance Procedures, as specified in paragraph 2.9.2.1 of the VVSG 1.0 Volume II:

- Equipment Utilized
- Software/Firmware Updates
- Battery Care and Service
- Confirming Correct Software Versions
- Personnel and Skills Required
- Preventative Maintenance Schedule

This includes the following information for each of the above procedures:

- Task(s) - please see the above list.
- Personnel required - the above Tasks require a Maintenance Technician. For more detailed information on the skills required, please see *2.10 Democracy Suite® Personnel Deployment* and *Training Requirements: Preventative Maintenance Tasks*.
- Maintenance tasks to be coordinated with Dominion Voting Systems - none

2.1.1 Equipment Utilized

All parts of ImageCast® X BMD and DRE platforms are as follows:

- ImageCast® X (device)
  - Avalue SID-15V
  - Avalue SID-21V
  - Avalue HID-21V
- Smart Card Reader/Writer - Advanced Card Systems Holdings Limited

- Printer:
    - HP LaserJet Pro M402dne
    - HP LaserJet Pro M404dn
    - HP LaserJet Pro M501dn
    - HP LaserJet Pro 4001dn
    - Avision AP3061
    - KFI VVPAT VRP3
    - KFI VVPAT VRP3 V1-C
    - SEIKO RP-D10
- UPS
    - APC Smart-Ups 1500VA LCD 120V
- ATI: Device for ADA voters:
    - Paddles
    - Audio
    - Sip and Puff
    - Headphones

The ImageCast$^{®}$ X BMD and DRE platforms components are easy to maintain because of modern plastics

and durable finishes. The recommended maintenance procedures include:

- Storing ImageCast$^{®}$ X equipment in a dry, clean environment
- Keeping the batteries charged
- Checking the ImageCast$^{®}$ X devices' battery status on a regular basis.

2.1.2 Software/Firmware Updates

The following update processes apply to both the Voting System Test Lab and jurisdictions using the ImageCast$^{®}$ X whenever an update on a system release is required.

- Incorporating hardware upgrades - new hardware upgrades are installed by Dominion Voting Systems - supplied Maintenance Technicians.
- Incorporating new software releases - new software releases are installed by Dominion Voting Systems - supplied Level 1 technician.

2.1.3 Battery Care and Service

This sub-chapter defines the following tasks to be performed for Battery Care and Service, as specified in paragraph 2.9.2.1 of the VVSG 1.0 Volume II, item a:

- Battery care
- Charging the battery
- Disposal of used batteries

2.1.3.1 Battery Care

It is recommended by Dominion Voting Systems to include the electrical wiring to the storage area so that the ImageCast® X device and UPS may be plugged into AC power for periodic battery charging.

To maximize battery life and performance it is important that the devices stored in a storage area are turned off and that the battery is charged periodically.

ImageCast® X Battery Care

Battery charging can be performed while the ImageCast® X devices are stored by making sure that part of the warehouse procedure is to connect power cords to each ImageCast® X device and to a switched AC power source.

Completely empty batteries take up to 12 hours to recharge. Dominion Voting Systems recommends that the warehouse is equipped with switched AC power for the storage area and that each device is charged for 12 hours each month, to ensure they are ready for use.

2.1.3.2 Battery Maintenance Procedures

This section outlines the procedures for maintaining the ImageCast$^®$ X and UPS batteries.

These procedures are recommended for battery maintenance throughout the entire battery lifespan:

- Observe and note the runtime that a new fully-charged battery provides for powering the ICX unit by performing the Battery Capacity Test. Perform the Battery Capacity Test every two (2) years regardless of usage to determine battery health.

- Consider replacing the battery with a new one if you note either of the following conditions:

    - For the **ICX Prime unit**:

        - The battery runtime drops below 2 hours.

        - The battery charge time increases significantly (Typical Charge time is 4 Hr. in ICX unit and 5-6 Hrs. using the charger).

    - For the **ICX Classic unit**:

        - The battery runtime drops below 10 minutes.

        - The battery charge time increases significantly (Typical Charge time is 4 Hrs).

    - For the **UPS unit**:

        - The battery runtime drops below 2 hours.

        - The battery charge time increases significantly beyond the typical charge time of 12 hours.

- Routinely check the battery's charge status.

- Carefully monitor batteries that are approaching the end of their estimated life.

- If you do not follow the storage instructions described in section "*2.1.3.2 Battery Maintenance Procedures*", and the battery runtime has significantly dropped, consider the battery to be damaged and needs replacement.

2.1.3.3 Battery Capacity Test Procedures

This section outlines the procedures for testing the capacity of the ImageCast® X batteries.

ImageCast® X Prime

The following procedure is recommended when an ICX unit is initially received and periodically tested every two (2) years for the entirety of the battery's lifespan regardless of usage frequency.

To test the battery:

1. Ensure that the ICX unit has a fully charged battery before performing this test. If the battery is not fully charged, then allow the ICX unit to run on external power until it's fully charged.

2. Note the start time.

3. Disconnect the external power cable, if it's connected, and turn on the ICX unit and allow it to run on battery, only for 2 hours.

NOTE: No action is required once the ICX is turned on. If an Election Project is loaded onto the ICX, the poll does not need to be opened for the purpose of this Battery Capacity Test.

4. If the battery is empty and the ICX unit shuts down in less than 2 hours, the following steps should be performed:

    a. Ensure that the external power cable is not plugged in.

    a. Power on the ICX unit.

    b. If the unit does not power on, the battery has FAILED the Battery Capacity Test. The battery should then be considered to be replaced.

    c. If the unit remains powered on, then fully charge the battery and repeat the Battery Capacity Test starting from step 1.

5. If the ICX unit remains powered on after more than 2 hours, the battery has PASSED the Battery Capacity Test.

6. Turn off the ICX unit.

7. Record the result of the test in a document or label it on a unit as such:

    - Unit #:
    - Tested: YYYY-MM-DD, Result: PASS/FAIL

8. Charge the battery to 100%.

ImageCast® X Classic

The following procedure is recommended when an ICX Classic unit is initially received and periodically tested every two (2) years for the entirety of the battery's lifespan regardless of usage frequency.

To test the battery:

1. Ensure that the ICX Classic unit is fully charged before performing this test. If the battery is not fully charged, then allow the ICX Classic unit to run on external power until it's fully charged.

2. Note the start time and disconnect the external power cable if it's connected and turn on the ICX unit and allow it to run on battery only for 10 minutes.

NOTE: No action is required once the ICX is turned on. If an Election Project is loaded onto the ICX, the poll does not need to be opened for the purpose of this Battery Capacity Test.

3. If the battery is empty and the ICX Classic unit shuts down in less than 10 minutes, the following steps should be performed:

   a. Power on the ICX Classic unit. Ensure that the external power cable is not plugged in.

   b. If the unit does not power on, the battery has FAILED the Battery Capacity Test. The battery should then be considered for replacement.

   c. If the unit remains powered on, then fully charge the battery and repeat the Battery Capacity Test starting from step 1.

4. If the ICX Classic unit remains powered on at the end of 10 minutes, the battery has PASSED the Battery Capacity Test.

5. Turn off the ICX unit.

6. Record the result of the test in a document or label it on a unit as such:

   • Unit #:

   • Tested: YYYY-MM-DD, Result: PASS/FAIL

7. Charge the battery to 100%.

2.1.3.4 Battery Storage Procedures

This section outlines the procedures that are recommended for storing the ImageCast® X Li-Ion Batteries.

ImageCast® X Prime

Battery Storage Outside of the Unit

These procedures are recommended prior to and during the ICX Li-Ion Battery storage period:

- The Li-Ion battery inside the ICX unit is charged to full (100%) capacity before storage.

- Remove the Li-Ion battery from the ICX unit and store it with other batteries in a controlled environment. Refer to section 6.0 Battery Shelf Life for the discharge rate when the battery is stored in this mode.

- When storing the batteries externally, please adhere to the following environment conditions: Maintain a storage temperature between 41 °F/5 °C and 68 °F/20 °C with a relative humidity between 30% - 60%.

- In this storage mode, inspect the charge level of the battery every 6 months and charge to full capacity only if the charge level falls below 50%.

- For tracking and to maintain a recharging schedule, please record the charging date stamp in a document or label it on the unit:
  - Unit #:
  - Charged: YYYY-MM-DD

Battery Storage Inside of the Unit

If the battery is stored in the unit then ensure to select **Prepare for Storage** option under the **Power Off** menu.

These procedures are recommended prior to and during the ICX Li-Ion Battery storage period:

- The Li-Ion battery inside the ICX unit is charged to full (100%) capacity before storage.

- To enable Storage Mode, in the ICX application, press **Power Off**, then press **Prepare for Storage**.

- Keep the Li-Ion battery inside the ICX unit.

- When storing the ICX unit, please adhere to the following environment conditions: Maintain a storage temperature between 41 °F/5 °C and 68 °F/ 20 °C with a relative humidity between 30% - 60%.

- In this storage mode, inspect the charge level of the battery every 6 months and charge to full capacity only if the charge level falls below 50%.

- For tracking and to maintain a recharging schedule, please record the charging date stamp in a document or label it on the unit:

  - Unit #:

  - Charged: YYYY-MM-DD

ImageCast® X Classic

Battery Storage using the *Prepare for Storage* Mode

If the battery is stored in the unit then ensure to select **Prepare for Storage** option under the **Power Off** menu.

These procedures are recommended prior to and during the ICX Classic Li-Ion Battery storage period:

- The Li-Ion battery inside the ICX unit is charged to full (100%) capacity before storage.

- To enable Storage Mode, in the ICX application, press **Power Off**, then press **Prepare for Storage**.

- When storing the ICX Classic unit, please adhere to the following environment conditions: Maintain a storage temperature between 41°F/5°C and 100°F/37°C (Optimal storage temperature is 50°F/10°C and 60°F/15°C) with a relative humidity between 0% - 95% (non-condensing).

- In this storage mode, inspect the charge level of the battery every 6 months and charge to full capacity only if the charge level falls below 50%.

- For tracking and to maintain a recharging schedule, please record the charging date stamp in a document or label it on the unit:

  - Unit #:

  - Charged: YYYY-MM-DD

Battery Storage using Power Off Mode

These procedures are recommended prior to and during the ICX Li-Ion Battery storage period:

- The Li-Ion battery inside the ICX unit is charged to full (100%) capacity before storage.

- Power off the ICX Classic unit.

- When storing the ICX Classic unit, please adhere to the following environment conditions: Maintain a storage temperature between 41°F/5°C and 100°F/37°C (Optimal storage temperature is 50°F/10°C and 60°F/15°C) with a relative humidity between 0% - 95% (non-condensing).

- In this storage mode, charge the battery to full (100%) capacity at least once every 2 months.

- For tracking and to maintain a recharging schedule, please record the charging date stamp in a document or label it on the unit:

  - Unit #:
  - Charged: YYYY-MM-DD

2.1.3.5 Storing the UPS

Before you store the UPS for an extended period of time, do the following:

1. Turn off the UPS by holding down the power button until the UPS emits one long beep and two short beeps.

2. Plug the UPS into a wall outlet.

3. Charge the battery for a minimum of twelve hours. The auto-charge feature allows the battery to charge while the UPS is turned off.

4. Cover the UPS and store in an environment with temperatures between 68°F to 77°F (20°C to 25°C).

Charge the UPS battery to full (100%) capacity at least once every 4 months, following the steps provided above.

NOTE: A single 15A circuit can support up to 4 UPS units charging at the same time. To avoid an overload, do not plug more than 4 UPS systems into the same 15A circuit.

2.1.3.6 Battery Shelf Life

This section explains the shelf life of the ImageCast® X Prime batteries.

The ICX Li-Ion battery shelf life varies depending on the exact storage procedure:

1. If the battery is stored outside of the ICX unit; the battery will automatically go to sleep mode.

    a. Self-discharge - less than 15% a year at room temperature.

    b. Non-recoverable capacity loss - less than 5% a year at fully charged at room temperature.

2. If the battery is stored within the ICX unit using the Software Storage Mode option, the battery will be forced to go to sleep mode.

    a. Self-discharge - less than 5% a month at room temperature.

    b. Non-recoverable capacity loss - less than 5% a year at fully charged at room temperature.

2.1.3.7 Battery Charging Procedures

These section outline the procedure for charging the batteries.

ImageCast® X Classic

Equipment needed:

- ICX Classic Unit
- AC Power Cord (Included with Unit)

Charge the ICX Classic battery by plugging in the Power Cord to the ICX unit and ensure that the 3-prong plug is directly inserted into a North American standard 115/120VAC 50/60Hz wall outlet. The unit can charge the battery even while powered down. It can take up to 4 hours to fully charge a depleted battery.

ImageCast® X Prime

Equipment needed:

- ICX Prime Unit/Dual Bay ICX Battery Charger
- ICX Li-Ion Battery
- AC/DC Power Adapter (s) 19VDC, 9.47A

Charge the Li-Ion battery by first inserting it into the ICX unit and plugging in the Power Adapter to the unit and ensure that the 3-prong plug is directly inserted into a North American standard 115/120VAC 50/60Hz wall outlet. The unit can charge the battery even while powered down. It can take up to 4 hours to fully charge a depleted battery.

NOTE: If 2 batteries are inserted into an ICX unit for charging, it can take approx. double the charging time, i.e. 8 hours to fully charge 2 depleted batteries.

Dual Bay Charging Procedure

The Li-Ion battery can be charged by directly inserting the Li-Ion battery into the Dual Bay battery charger. Ensure that the AC/DC adapter is connected to the charger, as shown below, and directly inserted into a North American standard 115/120VAC 50/60Hz wall outlet. Charge time of a fully discharged battery using the dual bay charger is between 5 to 6 hours. See Figure 2-1.
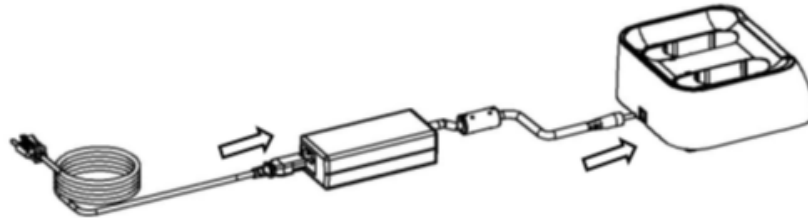

Figure 2-1: Dual Battery Charger

Dual Bay LED Indicator Description

There are two LED's on the front of the charger which act as indicators for power and battery status. See Figure 2-2.
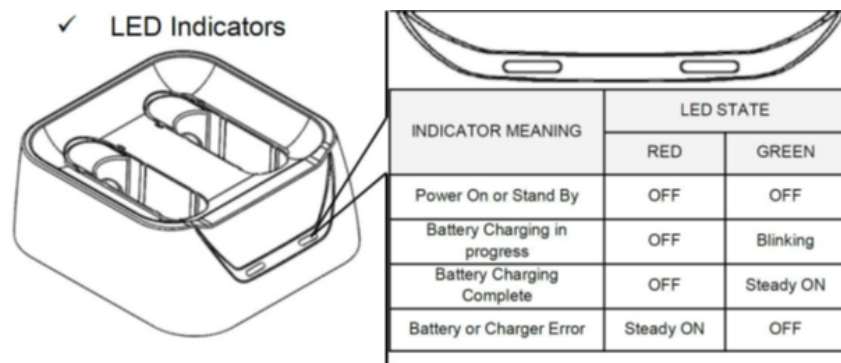

INDICATOR MEANING	LED STATE	
	RED	GREEN
Power On or Stand By	OFF	OFF
Battery Charging in progress	OFF	Blinking
Battery Charging Complete	OFF	Steady ON
Battery or Charger Error	Steady ON	OFF

Figure 2-2: Dual battery LED indicators

2.1.3.8 Disposal of Used Batteries

Dispose of used batteries according to the manufacturer's instructions where applicable. The ImageCast$^{®}$ X device use an internal battery. If a laptop computer is used as a server, the laptop computer has a replaceable battery.

Please note never to puncture the battery or improperly dispose it to avoid any hazardous risks.

2.1.4 Confirming Correct Software Versions

This sub-chapter defines the procedures for confirming the ImageCast® X software components are the correct state-certified and Dominion Voting Systems verified versions.

Check the version numbers of the following software components

- Device model and build

- ImageCast® X application

- Google Text-to-speech engine

This feature is accessible from the device's Settings screen and is intended for county workers. It shows the software version number for the ImageCast® X ballot marking platform device model number, used software components versions and ImageCast® X application version.

2.1.4.1 Device Model and Build

Use the following procedure:

1. From the device's Home screen or Applications screen, go to Settings.

2. In the Settings screen, tap the General tab.

3. In the General tab, tap About device.

4. In the Details about device screen, confirm the version numbers for the model number, and build number.

5. The ImageCast® X BMD/DRE platform is tested and verified to work on devices with the following:

   - Avalue SID-21V model number - byt_t_crv2

   - Avalue SID-15V and SID-21V build number - KTU84P.BCX11-V0.0.98 dev-keys

   - Avalue HID-21V (Prime) model number - HID-21V-BTX-01R

   - Avalue HID-21V (Prime) model number - HID-21V-BTX-B1R

   - Avalue HID-21V (Prime) model number - HID-21V-BTX-L1R

   - Avalue HID-21V (Prime) build number - Avalue-DVS-Prime-v8.1.0-01.01-1.1.7-0abe873

2.1.4.2 ImageCast® X application

Use the following procedure:

1. From the *Technical Administration* menu, go to **Device Setup**.

2. Under the *Update* column, verify that the version number is 5.17.

2.1.4.3 Google Text-to-speech engine

Use the following procedure:

1. From the device's Home screen or Applications screen, go to Settings.

2. In the **Settings** screen, tap the **General** tab.

3. In the **General** tab, tap **Application manager**.

4. In **Application manager details** screen, tap **Google Text-to-speech** engine.

5. In App info screen for Google Text-to-speech engine, confirm the version number is **3.15.18.**

2.1.5 Personnel and Skills Required

The skill level required for the individual preventative maintenance tasks is indicated in Table 2-1.

Maintenance Task	Skill Level Required	Number of Persons
Internal Battery Charging	Level 0	1
Printer cartridge (toner) replacement	Level 0	1
Software/firmware update	Level 1	1

Table 2-1: Required skill level for individual preventative maintenance

2.1.6 Preventative Maintenance Schedule

There are several maintenance procedures that need to be completed on schedule. The following schedule outlines the activities and when they should be performed.

1. On a monthly basis - recharge the ImageCast$^®$ X component's batteries.

2. Once every three months - inspect system parts and functions.

3. Prior to each election:

   a. Perform maintenance diagnostics

   b. Perform the Pre-LAT

4. Following the election - recharge the system component's batteries.

2.1.6.1 Procedures to Be Performed Once Every Four Months

The Preventative Maintenance procedure to be performed once every four months includes recharging the UPS batteries as described in "Battery Care and Service" on page 6.

2.1.6.2 Procedures to Be Performed Once Every Six Months

The Preventative Maintenance procedure to be performed once every six months includes recharging the ICX Lithium ION batteries as described in "Battery Care and Service" on page 6.

2.1.6.3 VVPAT Preventative Maintenance Procedures

To maintain optimum performance, the VVPAT should undergo a routine cleaning. This cleaning will remove any accumulated paper dust or other debris.

The following intervals are DVS recommendations - please follow the detailed cleaning instruction in *Paper Loading* and *Cleaning the Thermal Head* of the *Voter-verified Paper Audit Trail (VVPAT) User Manual*.

After every 3 rolls of paper:

1. Using a lint free cloth, clean the following parts:

   - The thermal head

   - CIS (contact image sensor) glass

   - Inversion plane top edge

2. Using a cleaning brush, remove any debris from the drive roll (Platen) and gears of the drive roller.

   NOTE: Do not use any type of liquid when cleaning the drive roller.

After every 20 rolls of paper:

1. Using a lint free cloth and a small quantity of ethyl or isopropyl alcohol, clean the following parts:

   - The thermal head

   - CIS (contact image sensor) glass

   - Inversion plane top edge

2. Using a clean brush and compressed air, clean the following parts:

a. Remove any debris from the drive roll (Platen) and gears of the drive roller.

   NOTE: Do not use any type of liquid when cleaning the drive roller.

b. If any debris remains, use a small amount of compressed air

c. Clean rewinder mechanism gears and slip clutch components with brush and compressed air to remove any accumulated paper dust and debris.

NOTE: Make sure any alcohol used in the cleaning has evaporated before closing the printer cover.

2.1.6.4 Preparing ImageCast$^®$ X BMD/DRE Platform for an Election

This sub-chapter defines the Preventative Maintenance procedures for preparing the ImageCast$^®$ X BMD/ DRE platform for an election. For the following preparatory procedures, please see 2.08 - Democracy Suite$^®$ ImageCast$^®$ X System Operations Procedures.

2.1.6.5 Procedures to Be Performed After the Devices Return from an Election

This sub-chapter defines the Preventative Maintenance procedure to be performed after the ImageCast$^®$ X BMD/DRE platform device's return from an election.

1. Check the units for shipping damage. Check for broken or missing legs, power cords and anything else associated with the devices.

2. Power-up the unit and check the LCD/touchscreen assembly for proper operation and cleanliness.

3. Charge the battery for 12 hours.

2.2 Corrective Maintenance Procedures

This chapter identifies the following Corrective Maintenance Procedures, as specified in paragraph 2.9.2.2 of the VVSG 1.0 Volume II:

- Steps to Replace Failed/Deficient Equipment
- Steps to Correct Deficiencies/Faulty Operations in Software
- Necessary Modifications for Software Coordination
- Personnel and Skills Required
- Maintenance Tasks to Be Coordinated with Dominion Voting Systems

2.2.1 Steps to Replace Failed/Deficient Equipment

These steps can be performed by a Level 1 technician:

- Diagnosis of Faulty Hardware
- Testing to Verify Correction of Problems

2.2.2 Steps to Correct Deficiencies/Faulty Operations in Software

These steps can be performed by a Level 1 technician:

- Diagnosis of Faulty Software
- Testing to Verify Correction of Problems

2.2.3 Necessary Modifications for Software Coordination

Please see section "Software/Firmware Updates".

2.2.4 Personnel and Skills Required

The skill level required for the individual corrective maintenance tasks is indicated in Table 2-2.

Maintenance Task	Skill Level Required	Number of Persons
Battery Replacement	Level 1	1
Aligning and Testing the Voter Card Reader	Level 0	1
Diagnosis of Faulty Software	Level 1	1
Testing to Verify Correction of Problems	Level 1	1
Printer cartridge (toner) replacement	Level 0	1
Cleaning Smart Card	Level 0	1

Table 2-2: Required skill level for individual corrective maintenance

2.2.4.1 Cleaning Smart Cards

In the event the error message "Unable to read Smart Card" appears, clean the chip on the Smart Card with a microfibre cloth and isopropyl alcohol.

Allow sufficient time for the residual alcohol to evaporate before inserting the Smart Card into the reader.

2.2.5 Maintenance Tasks to Be Coordinated with Dominion Voting Systems

For replacement parts, please contact Dominion Voting Systems at:

Dominion Voting Systems

1201 18th St., Suite 210

Denver, CO, USA

80202

Telephone: 720.257.5209

Facsimile: 720.257.5209

NOTE: These procedures should be performed by a Maintenance Technician.

NOTE: When disassembling the system, or replacing components, verify that the system is disconnected from the AC power outlet.

Troubleshooting the ImageCast$^®$ X BMD/DRE platform is not an exact science, but more an exercise in common sense.

It is a dynamic process of diagnostics, following a logical sequence of actions that ultimately yields solutions to problems.

This chapter describes common problems and possible solutions, along with discussions on skill levels and tools to aid in the problem resolution.

Rule number one in troubleshooting is to always look for the obvious.

For example, you would not tear your machine apart looking for a defective power supply until you are satisfied that the wall outlet you are plugged into is working.

A good troubleshooting technique is a step-by-step process of elimination, beginning with the most obvious.

Dominion Voting Systems prescribes the part swapping method as a way to isolate problems.

You may suspect that you do have a problem with the power supply - by swapping out the suspect assembly with a known good unit you have a good chance of isolating the problem.

You can use this process for practically any assembly in the system. When you have successfully isolated the defective part, Dominion Voting Systems will aid you in securing a replacement, or you may have spares in stock to use to complete the repair.

CHAPTER 3: MAINTENANCE EQUIPMENT

ImageCast® X does not require any special maintenance equipment other than what is listed in section "Parts and Materials" and 'Maintenance Facilities and Support".

CHAPTER 4: PARTS AND MATERIALS

This chapter provides detailed documentation of the parts and materials needed to operate and maintain the system, as specified in paragraph 2.9.4 of the VVSG 1.0 Volume II:

- Common Standards
- Paper-Based Systems - N/A

The supplies and spare parts listed in this chapter are items that will normally require replacement because of usage, loss, or because they have become worn out.

It is recommended that the customer has a quantity in stock.

For parts and materials, please contact Dominion Voting Systems at:

Dominion Voting Systems
1201 18th St., Suite 210
Denver, CO, USA
80202
Telephone: 720.257.5209
Facsimile: 720.257.5209

4.1 Parts List

4.1.1 Avalue SID-15V/SID-21V and Avalue HID-21V (DRE w/o VVPAT)

- One (1) Multipurpose paper pack, 8 1/2" x 11", 24 Lb, ream of 500 sheets
- One (1) Power cable
- One (1) USB-A to USB-B cord (printer cable)
- One (1) Appropriate laser printer cartridge toner
- One (1) Set of headphones with 3.5 mm stereo jack

4.1.2 Avalue SID-15V/SID-21V and Avalue HID-21V (DRE w/o VVPAT)

- One (1) Power cable
- One (1) Set of headphones with 3.5 mm stereo jack
- One (1) KFI NAUT 324C Thermal report printer
- Two (2) USB media

4.1.3 Avalue SID-15V and SID-21V (DRE w/ VVPAT)

- One (1) Power cable
- One (1) Set of headphones with 3.5 mm stereo jack
- One (1) KFI VVPAT VRP3
- One (1) USB-A to mini USB-B
- One (1) Power Supply 24V DC; 2.7 A
- Two (2) USB media

4.1.4 Avalue HID-21V (DRE w/ VVPAT)

- One (1) Power cable
- One (1) Set of headphones with 3.5 mm stereo jack
- One (1) KFI VVPAT VRP3 (V1-C)
- One (1) USB-A to mini USB-B
- One (1) VVPAT Printer Power Cable
- Two (2) USB media

CHAPTER 5: MAINTENANCE FACILITIES AND SUPPORT

The measured Availability is greater than 99.5% in implementation These measurements were obtained under situations where:

- MTTR was 0.66 hours.
- The ratio of spare machines to operational machines was 10%.
- One technician was allocated for each set of 25 machines.
- No technician was more than one-hour transit time from any unit.
- All technicians used the Help Desk for any action.
- Help Desk support of one person was provided for every ten technicians.

Help Desk staff must be vendor staff. Field Technicians can be vendor staff, but third party staff or jurisdiction staff can attain accreditation by taking training courses offered by the vendor.

All facilities, furnishings, fixtures, and utilities that are required for equipment maintenance are described in sections *2.1 Preventative Maintenance Procedures* and *2.2 Corrective Maintenance Procedures*.

Details for Operations Support are provided in "Chapter 6: Operations Support" in *2.08 - Democracy Suite® ImageCast® X System Operations Procedures*.

Please check the documentation for each of the hardware components for further details about storage requirements.

REVISION HISTORY

Rev.	Date	Summary
4	05-02-2023	• Revised for grammar and content corrections
3	04-17-2023	• Revised using 5.17-CO doc revisions
2	04-05-2023	• Revised with grammar and content corrections
1	02-13-2023	• Branched from 5.17-CO

LIST OF TABLES

VVSG Trace List

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