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MINI Z™

Handheld Z Backscatter® X-ray Screening System

Operator Manual

342-9000-1 Rev. B
ECCN EAR99

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The microSD memory card slot and microSIM slot accept external cards. American Science and Engineering accepts no responsibility for loss of data or improper operation of cards used or hot-swapping cards and batteries with this system.

Revision Table

Revision	Date	Comments
A	March 2018	Prototype Release
B	May 2018	Initial Release
C	—	—

Table of Contents

Preface

This manual describes the basic operation of the AS&E® MINI Z™ Handheld Z Backscatter®, X-ray Screening 120kV Scan Power System, (scanner unit P/N 342-0600-1, shipped set P/N 342-0500-1).

WARNING

The equipment described in this manual is intended for operation only by qualified users who have been trained for operation of the equipment, and who have a technical understanding of the effects of X-ray radiation and knowledge of X-ray technology.

What's New

This manual is an introduction to the 120kV generation of the MINI Z system. The system includes additional power for imaging and to support future feature extensions. This release includes the following updates:

- 120 kV X-ray beam penetration power
- New high-resistance Calibration Dock: black casing treatment distinguishes the 120kV version
- Overall increase in system speed and image processing
- Automatic conversion from dynamic contrast mode to manual contrast
- Dedicated **Export** screen for offloading image files
- Inspection delete function moved to the **Review** screen
- New intuitive **Home** screen icons
- Dual WiFi band options
- Ruggedized tablet computer (for control button maps, see Table A-6)
- Direct Ethernet cable tablet connection
- Optional laser guide beam disable
- Stitched multi-image group scans now accept all enhancement operations
- Interactive histograms for direct optimization of contrast and brightness

Control Interface

Users must have a working knowledge of touchscreen technology, and in addition supervisors must have a working knowledge of the Microsoft® Windows® 10 operating system.

The system is designed so that a user can perform scanning without having direct access to the operating system of the tablet. Administrative access to the tablet operating system is required for the following purposes: setting Airplane Mode (WiFi blocking), setting screen brightness, setting date and time, and resetting the Windows password and accessing Windows Defender. Any additional actions within the operating system are not allowed and may void the warranty.

Operator Manual

A copy of this manual is installed on the system tablet. To access that copy, perform the following steps:

1. In the Home Screen, tap the **Help** button . The **Help** screen opens.

   If necessary, tap the **Operator Manual** button. The manual opens in a viewer screen.

   For first time views, the Adobe PDF End User Agreement may appear. Tap the **Accept** button to continue.

2. To expand or reduce the size of the manual pages on screen, tap with two fingers on the screen, and spread them to enlarge, and join them to reduce, the page size.

Figure Preface-1: PDF Scrolling. To move to a specific page, tap the PDF image, to open a scroll button. Tap and drag the scroll button and the current and total page number count displays interactively.

After the manual has been opened, the user can go to other screens, perform tasks, and return to the manual. The same page will be displayed.

3. To exit the viewer and go to another screen in the ASEInspection ™ Software, tap the Back button to go to the **Home** screen or the Status button to go to a **Status** screen.

For quick guides, see Section 3.6, Initial Configuration.

Searching for Words in Help

The Operator Manual is an interactive PDF file:

- Blue-colored **text** indicates a link. Tap the text to jump to the hyperlink destination.
- To search using conditions, in the vertical toolbar at the side of the screen, tap the binoculars button . The screen updates to display the **Search** panel with a text entry box.

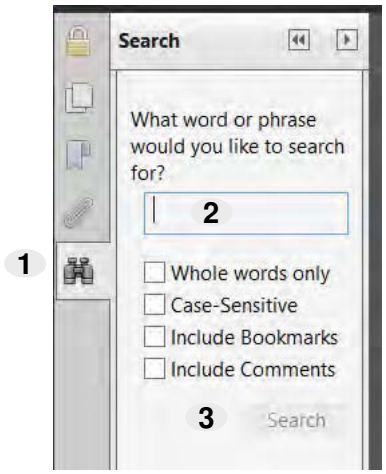

Figure Preface-2: **Search** Panel. (1) Tap the binoculars button to open the panel. (2) Tap in the text box to start typing as the keyboard pane appears. (3) Tap the **Search** button to perform the search.

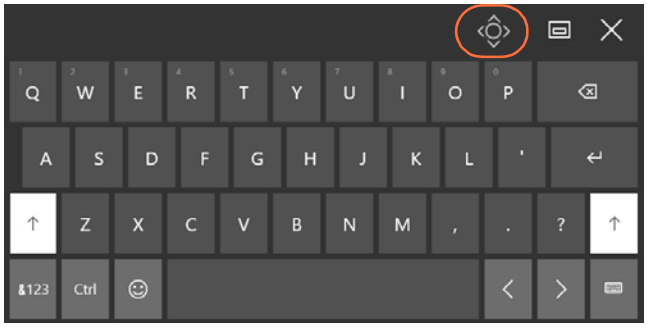

Figure Preface-3: On-screen Keyboard. To use the on-board keyboard, tap any text-entry box. The on-screen keyboard appears. See Section 3.4.3.

The on-screen keyboard stays visible until closed. To close the keyboard, tap the “X” icon on the Title bar of the keyboard. To move the keyboard tap the title bard, then tap and drag the start button that appears (circled).

Document Conventions

The product described in this manual has both mechanical and digital interfaces. The digital interface is a tablet, primarily activated by performing gestures on the touchscreen (see Section 3.4.5, Hand Gestures) of the tablet, but some text entry is required. In this manual, the following conventions are used:

- **Bold lettering** is used to indicate text in tables and menu options displayed by the tablet.
- *`Monospace lettering`* indicates text to be typed into the tablet screen using the on-screen keyboard.
- Blue text indicates a text link to a related topic in this manual. Tap to follow link.

Related Documents

This section provides a summary of the steps required to operate the system from initial configuration to shutdown after a scanning session. The individual full sections referenced should be reviewed and understood before carrying out these steps. In particular, carefully review *Chapter 2, System Safety*.

- The **Basic Operation** card is provided as a hardcopy insert into the shipping case with the system, and provides a simplified instruction to get the system operational, test, and shut down.
- The **Getting Started** pamphlet is provided as a hardcopy insert into the shipping case with the system, and provides instructions to get the system operational, test, and shut down.
- The **Quick Start** is provided on the tablet, and provides a simplified instruction to get the system operational after starting the tablet. Click the **Help** button for access.

This **Operator Manual** is available on the tablet. Click the **Help** button for access.

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WARNING

The quick guide references do not take the place of completing a training course and reading and understanding this entire manual. The MINI Z™ system emits an ionizing radiation beam. In order to operate the MINI Z in a safe manner, be sure to read and understand this entire manual.

Contact Information

For technical support, please contact AS&E®:

- Phone: +1 (978) 262-8700, Option 4
- E-mail: service@as-e.com

For more information on AS&E products and technologies, please visit www.as-e.com.

For sales of this and other AS&E products, contact:

- Sales: sales@as-e.com
- International Sales: intlsales@as-e.com

Please contact techpubs@as-e.com with any comments or suggestions regarding this manual.

NOTE

Your local, state, provincial, or national government may require registration of this system under their X-Ray regulations. Please consult with a local authority to determine applicability.

About AS&E

American Science and Engineering, Inc. (AS&E) is the trusted global provider of threat and contraband detection solutions for ports, borders, military, critical infrastructure, law enforcement, and aviation. With over 50 years of experience, AS&E offers proven, advanced, X-ray inspection systems to combat terrorism, drug smuggling, illegal immigration, and trade fraud. AS&E systems are designed in a variety of configurations for cargo and vehicle inspection, parcel inspection, and personnel screening. Using a combination of advanced technologies, these systems provide superior detection capabilities, with high-energy, dual-energy transmission, and Z Backscatter X-rays—pioneered and perfected by AS&E.

Z Backscatter Technology

As X-Rays hit an object, some are absorbed, producing a transmission X-Ray image, and others are “scattered” (Compton Scattering). Z Backscatter images are formed from the X-Rays that are scattered back toward the X-Ray source. Compton scattering is material-dependent, with the lower atomic number materials scattering more strongly than the higher numbered ones.

Products and Markets

AS&E offers several lines of X-Ray systems for critical security applications to combat terrorism, drug and weapon smuggling, trade fraud, and illegal immigration. These systems include: Cargo and Vehi-

cle Inspection, Backscatter-Only Inspection, Parcel, Mail and Package Inspection, and Personnel Screening.

Z Backscatter Inspection Systems include the Z Backscatter® Van (ZBV®), a mobile cargo and vehicle screening system, and Z Portal®, a drive-through cargo and vehicle screening system. Z Backscatter X-ray technology provides high-quality, photo-like images that offer outstanding detection of organic materials, such as plastic explosives and drugs. These systems allow for rapid screening of containers and vehicles for terrorist threats, trade fraud, stowaways, and contraband. The ZBV is an industry leader for drive-by screening systems because of its low-cost, flexibility, and maneuverability — all contained in a commercially available delivery van. The AS&E Z Portal is a multi-view, drive-through inspection system capable of scanning cars, vans, trucks, and their cargoes for threats and contraband.

Cargo and Vehicle Inspection includes the OmniView® Gantry, a high-energy inspection system which utilizes dual-energy transmission technology. It is ideal for inspecting vans, trucks, and air and sea cargo containers for a variety of materials including explosives, drugs and weapons. The OmniView Gantry features powerful 4/6 MeV high-energy transmission X-rays that penetrate up to 400mm (15.7 inches) of steel. The Sentry® Portal is a high-throughput, high-energy, drive-through inspection system that offers a compact radiation footprint and dual-energy transmission imaging of trucks, cargo containers, and tanker trucks. The Z Portal® system is a drive-through cargo and vehicle screening system that combines dual-energy transmission inspection plus Z Backscatter® and Forwardscatter® views for left, right, and top-side imaging of cargo. The Z Portal® and the Sentry® Portal can be co-located for a multi-faceted solution. AS&E's broad range of cargo and vehicle inspection systems are designed to combat terrorism, trade fraud, drug trafficking, and weapons smuggling.

Parcel, Mail, and Package Inspection Systems include the Gemini® inspection system, a multi-technology parcel system that combines dual-energy transmission and Z Backscatter X-rays for the most complete and accurate threat detection available. Dual-energy transmission provides outstanding image quality, and enables the quick detection of a wide variety of threats such as guns, knives, and wires for explosive devices. The Gemini system Z Backscatter X-rays simultaneously generate an image that provides enhanced detection of organic materials such as plastic explosives (including sheet and liquid explosives), drugs, and plastic weapons. The combination of technologies dramatically increases the likelihood of finding illegal materials hidden in parcels. AS&E also offers parcel systems with varying tunnel sizes and configurations to fit diverse applications and inspection environments. These systems are primarily used in government facilities, airports, high-security federal facilities, commercial office buildings, and convention centers.

Personnel Screening (SmartCheck®) System is a safe, non-intrusive system that allows users to detect threats and contraband hidden on a person. The system displays both organic and inorganic materials, revealing objects such as guns and knives, plastic and liquid explosives, composite weapons, and other hidden threats and contraband. The SmartCheck system employs a software algorithm to protect the privacy of screened passengers while still effectively displaying threats. The privacy-filtered image provides users with information to identify the nature and location of any threats, but it will not show

revealing images of the screened individual. The privacy-filtered image shows an outline of the passenger and outlines any potential threats on the person.

Customers

Customers of AS&E include leading governmental agencies, border authorities, military bases, airports, and corporations worldwide, including the U.S. Department of Homeland Security, U.S. Department of Defense, U.S. Navy, U.S. Air Force, U.S. Customs and Border Protection, NATO, Royal Thai Police, HM Revenue & Customs (U.K.), and Hong Kong Customs.

To date AS&E has sold over 3,600 parcel, personnel, and portable inspection systems and more than 1,000 cargo and vehicle inspection systems. Our Z Backscatter Van (ZBV) is the largest selling cargo and vehicle inspection system in the world with over 140 customers in 67 countries.

Company History

AS&E has a strong and storied history of scientific innovation, particularly in the field of X-Ray technology. Formed in 1958, AS&E began as a developer of scientific instruments and applications for NASA. In 1959, Dr. Riccardo Giacconi joined AS&E and created an X-Ray astronomy team. In the coming decades, Dr. Giacconi's team made a succession of pioneering discoveries and developments in the field of X-Ray technology, including the discovery of the first known X-Ray source outside the solar system (1962), the first successful soft X-Ray photograph of the sun (1965), the launch of the first satellite dedicated completely to X-Ray astronomy (1970), and the launch of the Einstein Observatory, the world's largest X-Ray telescope (1978). Dr. Giacconi's pioneering work at AS&E later earned him the Nobel Prize in Physics.

In subsequent years, AS&E also developed innovative technologies in the fields of defense, education, medicine, non-destructive testing, and security. Additional AS&E technological achievements include: development of low energy, high resolution Computed Tomography (CT) scanning of the human body, derivatives of which are used today in medical scanning systems worldwide; as well as development of the first practical rail car inspection system used by the U.S. Government to scan rail cars leaving Russian missile factories, to confirm compliance with the 1972 Intermediate Range Nuclear Forces Treaty. AS&E also designed and implemented high-resolution non-destructive testing systems to inspect aluminum welds on the U.S. Space Station.

Today, AS&E X-Ray systems offer the most advanced technologies available to detect threats and contraband. Governments and businesses around the globe count on AS&E detection systems to combat terrorism and trade fraud.

Chapter 1 Basics

This chapter is intended to allow the operator to quickly test the operational condition of the MINI Z system as received.

WARNING

The equipment described in this manual is intended for operation only by qualified users who have been trained for operation of the equipment, and who have a technical understanding of the effects of X-ray radiation and knowledge of X-ray technology. This basic procedure is intended solely to allow the operator to confirm the operational status of the system as received, before continuing with the remainder of system setup and use descriptions in this manual and in training sessions.

Table 1-1: Initial System Operational Test

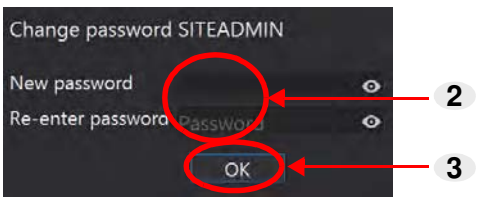
1	[Setup] On the tablet: 1. Insert, lock, and charge the battery pack. 2. Press the Power button and release when the Power LED is steady green. The tablet requires approximately 30 seconds of time to power-on and open the ASEInspection software	
2	[Setup] On the tablet: 1. Tap the **Accept** button for the End-User Agreement to continue. 2. Type a password twice. (Memorize it!) 3. Tap the **OK** button.	 

Table 1-1: Initial System Operational Test (continued)

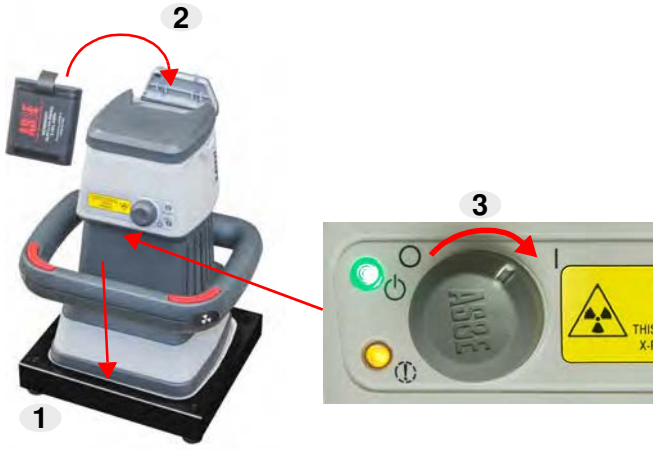
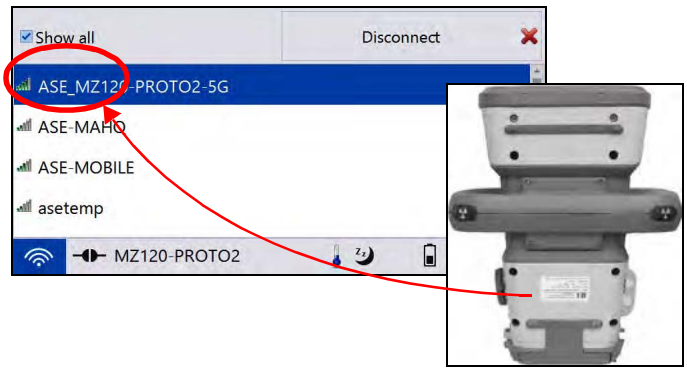
3	[Setup] On the scanner unit: 1. Place the scanner unit in the Calibration Dock. Ensure the Calibration Dock is rated for 120kV (metal frame is black color) 2. Charge and place a battery in the chamber; close door. 3. Turn the key clockwise to the On (|) position. (Blinking yellow light ⓘ indicates seeking a tablet connection.)	
4	[Setup] On the tablet: 1.Tap the WiFi button .	
5	Background color can be set by the user later, either the initial dark or lighter. [Setup] On the tablet: 1.Tap the serial number that is on the scanner unit label (“SN…”). (Wait for connection.) 2. When connected, the list closes automatically. (On the Scanner Unit, the yellow light ⓘ changes to continuous on.)	

Table 1-1: Initial System Operational Test (continued)

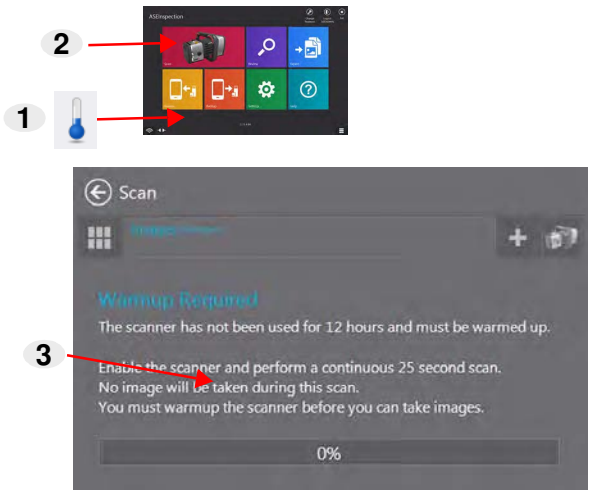
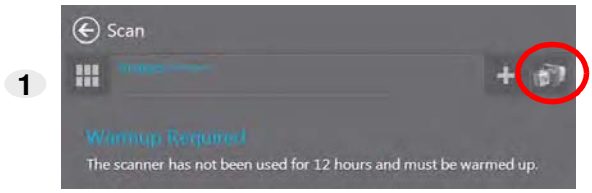
6	[Warmup] On the tablet: 1. If the system has not scanned within the last 12 hours, the thermometer icon appears at the bottom of the tablet screen, indicating that a warm-up of 25 seconds of time is required. 2. Tap the **Scan** tile  . 3. If warmup is required, the **Warmup Required** screen opens. Otherwise, skip to step 10.	
7	[Warmup] On the tablet: 1. Tap the Enable Scan button  . The scanner unit enables, and the background of the button changes to blue  .	
8	[Warmup] On the scanner unit: 1. Press and hold one of the red trigger buttons. 2. The four warning lamps  on the scanner handle corners illuminate. The scanner beeps. X-rays are emitting. On the tablet: 3. The Warmup progress bar moves. In the Status bar, the Radiation symbol  appears.	

Table 1-1: Initial System Operational Test (continued)

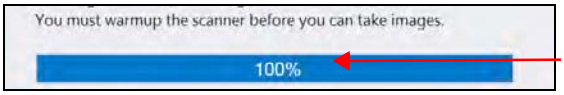
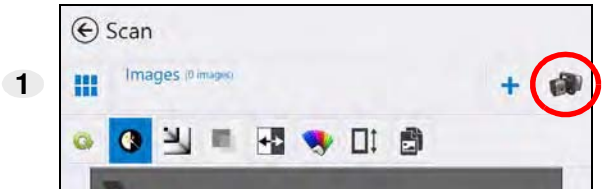
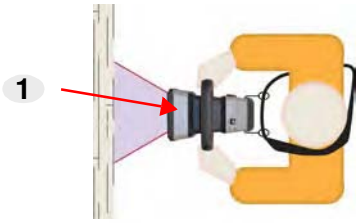
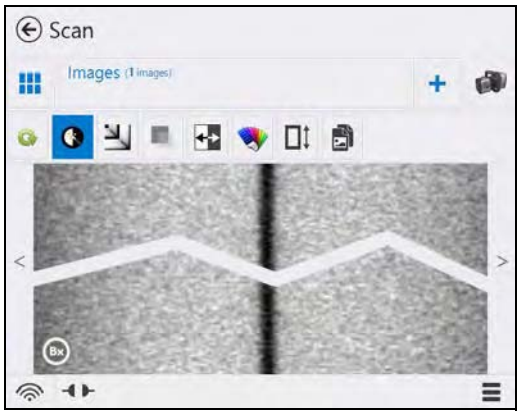
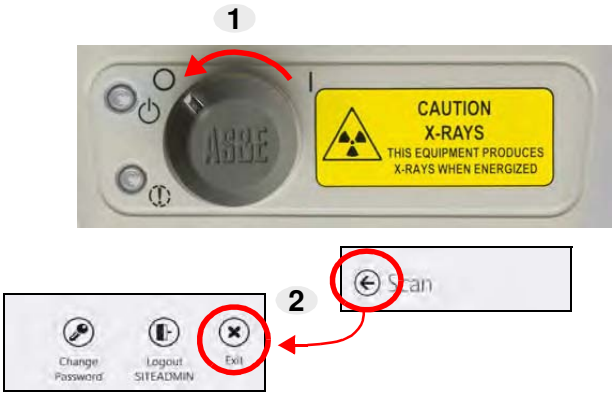
9	[Warmup] On the tablet: 1. The Warmup progress bar moves to 100% (25 seconds). On the scanner unit: 2. The four warning lamps on the scanner handle corners extinguish. The scanner beeps twice. 3. Release the red trigger buttons.	 
10	[Scan] On the tablet: 1. Tap the Enable Scan button (after 35 seconds, to enable again); the button displays the blue background).	
11	[Scan] On the scanner unit: 1. Point the scanner unit away from all personnel. 2. Press and hold one of the red trigger buttons. 3. The four warning lamps on the scanner handle corners illuminate. The scanner beeps. X-rays are emitting.	 

Table 1-1: Initial System Operational Test (continued)

12	[Scan] On the scanner unit: 1. At the end of the scan (30 seconds maximum) release the red trigger buttons. 2. The four warning lamps on the scanner handle corners extinguish. The scanner beeps twice. 3. The scan image is saved automatically. (The image in this example is the test pattern from the Calibration Dock.)	
13	Power off in either order: 1. The scanner unit: key to the Off (O) position. 2. The tablet: tap Back to Home page, then tap **Exit** .	

Chapter

2

System Safety

This chapter provides information on the safe operation of the AS&E® MINI Z™ Handheld Z Backscatter Screening system. This chapter should be read completely and understood before starting to operate the system.

2.1 Symbols

See Table 2-1 for a list and definitions of common symbols that may be used in this manual and/or on AS&E equipment.

Table 2-1: List of Symbols

Symbol (colors vary)	Explanation
	Danger - Warning - Caution. Risk of danger or damage. See Section 2.2, Admonitions.
	Caution. Risk of electric shock.
	CAUTION X-RAYS. Equipment produces X-rays when energized.
	(Regional) CAUTION X-RAYS. Equipment produces X-rays when energized.

2.2 Admonitions

Throughout this manual, safety messages are enclosed in different types of information boxes. These admonitions are described below.

2.2.1 Warning Information Box

WARNING indicates a potentially hazardous situation, which, if not avoided, **could** result in death or serious injury.

As used in this manual, a Warning box may appear in procedures or in general text.

- In procedures, a Warning box means that the ***next*** task, check, or procedure involves a hazardous situation that, if not avoided, **could** result in death or serious injury.
- In general text, a Warning box means that the conditions, equipment, or circumstances described create a hazardous situation that, if not avoided, **could** result in death or serious injury.

Figure 2-1: Warning Information Box

2.2.2 Caution Information Box

CAUTION indicates a potentially hazardous situation, which, if not avoided, **could** result in minor or moderate injury.

As used in this manual, a Caution box may appear in procedures or in general text.

- In procedures, a Caution box means that the ***next*** task, check, or procedure involves a hazardous situation which, if not avoided, **could** result in minor or moderate injury.
- In general text, a Caution box means that the conditions, equipment, or circumstances described involves a hazardous situation which, if not avoided, **could** result in minor or moderate injury.

Figure 2-2: Warning Information Box

2.3 General Hazards

MINI Z equipment includes, but is not limited to, the following potential hazards:

- X-rays (this device emits a directional beam of ionizing radiation; always act with caution when operating the product or when near the product when it is being operated)

WARNING

The MINI Z™ system emits an ionizing radiation beam. In order to operate the MINI Z in a safe manner, be sure to read and understand the entire manual.

- The MINI Z contains an X-ray tube that generates X-ray radiation when powered by electrical means. The MINI Z does not contain any radioactive elements. When the MINI Z is not powered-on, it is not a source of radiation.
- High voltages (within safety enclosure; do not open housing or perform modifications without authorization from AS&E)
- Moving parts (within safety enclosure; do not open housing or perform modifications without authorization from AS&E)
- Portable equipment drop hazard; consider using protective footwear.
- Cables between components; trip or entanglement hazard
- Strong light from the tablet rear camera LED light; do no look directly into the beam
- Do not turn the tablet volume high when using headphones
- Heat from tablet circuitry on rear of tablet and from AC adapter may cause low-temperature burns if carried next to a person's skin for long periods of time while in operation

WARNING

Be careful of the Ethernet cable.

- Lasers. Two Class 1 laser guide beams can be enabled to indicate the X-ray beam path.

WARNING

Although the laser beams are low power, Class 1, it is recommended never to look directly into the laser beam, and the lasers should never be directed toward the eyes.

In addition, the beams indicate the extents of the X-ray beam. Never pass any body part in front of the X-ray beam.

2.4 General Operational Safety

The MINI Z is designed for operation in compliance with generally accepted health and safety standards, including, but not limited to, CE standard IEC 61010.

In general:

- No living person, animal, or plant should be exposed to the direct X-ray beam emissions from the MINI Z system. In addition, the backscatter area should be avoided. For more information, refer to Figure 2-3.

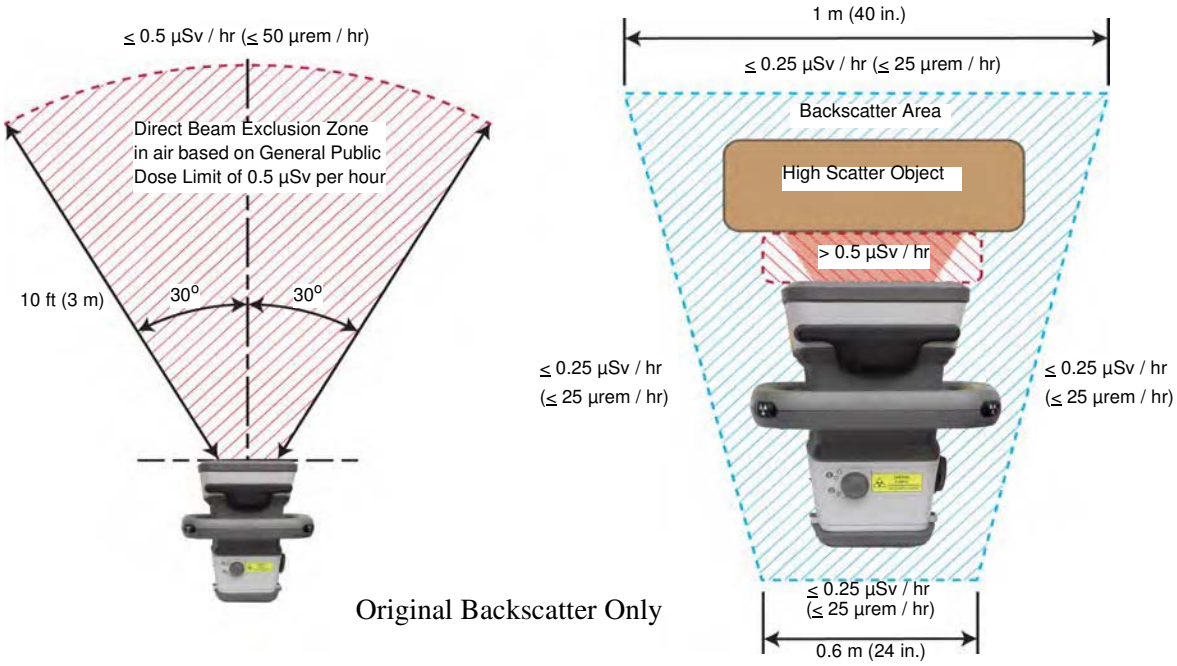


Figure 2-3: (Left) Radiation Dose Boundaries in Air, (right) Radiation Dose Boundaries While Scanning

- The MINI Z emits less than 50 µrem/hr (0.5 µSv/hr) to the user and to any other persons who are outside of the exclusion zone surrounding the direct X-ray beam emissions.
- During normal operation, the MINI Z is safe for the user and for people, animals, and plants that are outside of the exclusion zone surrounding the direct X-ray beam emissions.

WARNING

The MINI Z must not be used to scan human beings or animals.

- Safety is assured as long as the system is secure, all panels are intact, and all interlocks are operating properly. The MINI Z is designed with hardware and software interlocks throughout the sys-

tem. Tamper-evident stickers are placed on the bottom panel, at front and rear (see Figure 2-4). In addition, moisture detection stickers are installed within the scanner housing.

- The WiFi connection is a secured, encrypted link.

2.5 Safety Procedures

WARNING

System contains no user-serviceable parts. System should be returned to AS&E for maintenance and repairs.

The tablet main battery and scanner battery are Lithium-Ion type and should be removed before shipment and the contacts covered using the battery covers provided. Labeling should conform with IATA rules.

The MINI Z is designed for safe operation. Improper use of the equipment may expose the user and persons in the adjacent area to radiation, electrical, or mechanical hazards.

IMPORTANT: *All* user personnel must be trained on radiation hazards and how to safely operate the product. AS&E recommends that personnel complete a training course covering radiation safety and the use and operating principles of the MINI Z.

All users must observe the following safety rules.

- **Read this manual completely before operating the equipment!**

  Pay attention to all WARNING and CAUTION messages in the manual.

- **Allow only authorized and trained persons to operate this equipment.**
- **Observe safety precautions:**
  - Inspect the equipment each time the system is operated.
  - Report and change or damage to the system to the AS&E Field Service.
  - Do not override any of the safety interlocks.
  - Do not insert any part of the body (or any other objects) into X-ray generating equipment or electronic housings while X-rays are being generated.
  - Do not open the MINI Z housing.
  - Do not leave the system unattended at any time while it is in operation.
  - Do not attempt to service AS&E X-ray equipment unless trained and certified by the manufacturer.
- **Store and transport the equipment properly.**
  - Do not use tablet batteries that have been dropped or subjected to excessive shock, are wet, or have been exposed to excessive heat, or are swelling.
  - Do not drop the tablet or scanner product

- Do not use a damaged or wet tablet AC adapter; close the connector cover tightly when moisture or other foreign materials are present in the environment

WARNING

Do not reach into the beam path while X-rays are being generated.

Do not look into the two laser guide beams emitting from the scanning surface of the scanner unit.

2.6 System Decommissioning

Please be aware that at the end of its service life, an x-ray scanning system may contain materials and/or components that have the potential for an environmental impact. Therefore, the system might require special consideration for disposal.

This system may contain the following materials or components:

- Lead (Pb) – Typically can be recycled or reused.
- Oil
- X-ray tube
- Electronics, including removable Li-ion batteries that can be recycled and the tablet built-in Bridge Li-polymer battery and clock battery that can be recycled

Please consult your local regulatory authority when disposing of your system and/or any of its materials and components.

2.7 X-Ray Safety

The MINI Z system complies fully with radiation performance standards for open X-ray systems.

The X-ray module of the system is enclosed in a sealed, tamper-evident external housing. There are no user-serviceable components inside, and it is a hazard if opened and voids the warranty.

It is good practice to establish a program of instruction for all employees working in the area of the X-ray scanners. These are portables and care must be taken to restrict areas where untrained people are present. Consider restricting access, and posting warnings about radiation safety and the proper cautions and procedures for working with instruments that produce radiation.

It is important to the safety of the users and bystanders that users are fully aware of the significant dangers from the misuse of X-rays. Note particularly that X-rays are fully capable of penetrating through objects being scanned. Every organization using these types of devices should have a strong commitment to radiation safety.

2.7.1 Visual Warnings of X-Ray Emissions

The MINI Z visual X-ray generation indicators are as follows:

- Four red LED “X-ray On” indicators on the scanner handle (Figure 2-4)
- One safety label, on top surface of scanner, shown in Figure 2-4, near the key.

Figure 2-4: Safety label on scanner housing, next to the key.

- Two Class 1 laser guide beams are available to indicate the X-ray beam path. These two beams are located on the left and right sides of the X-ray emission window on the scanner face, and are set at the 60° fan angle of the emitted X-ray beam, so they can serve as visual indicators of the extents of the beam path. When enabled in the **Settings > General > Laser** option group (Section 3.6.7, ASEI Laser Guide Beams), the laser beams are illuminated at all times when the X-ray beam is being emitted (see Figure 2-5).

Although the laser beams are low power, Class 1, it is recommended never to look directly into the laser beam, and the lasers should never be directed toward the eyes.

In addition, the beams indicate the extents of the X-ray beam. Never pass any body part in front of the X-ray beam.

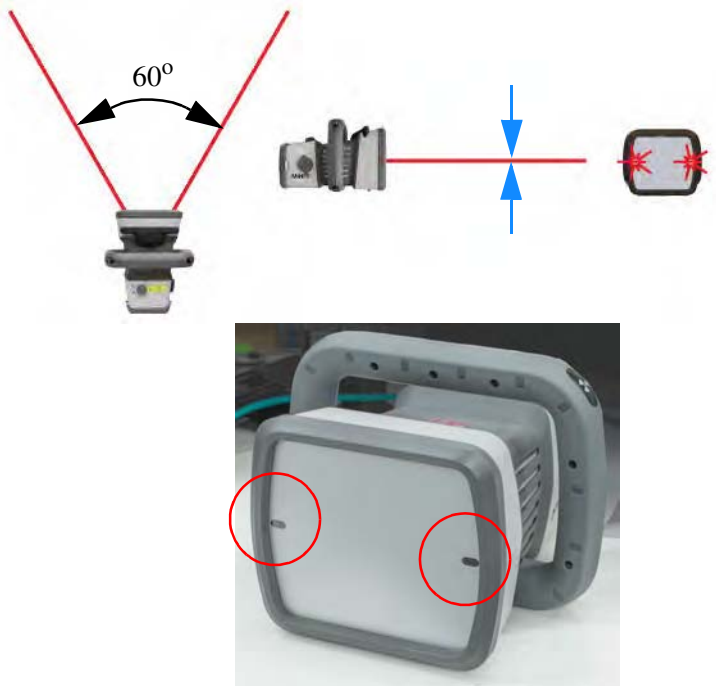


Figure 2-5: Dual laser beams visually indicate the X-ray beam path. The upper left panel shows the left-right beam fan angle of approximately 60°. The up-down fan angle is negligible, as indicated by the blue arrows in the upper middle panel.

2.7.2 Wifi Audible Warnings – X-Ray Emissions

The MINI Z has one audible X-ray generation indicator. It consists of an audible beep.

The quantity of beeps can be configured on the tablet to match local governmental regulations:

- **Normal** – At the beginning of an X-ray emission, one beep. At the end of an X-ray emission, two beeps. There are no beeps during the X-ray emission.
- **Extended** – At the beginning of an X-ray emission, five beeps. At the end of an X-ray emission, two beeps. During the X-ray emission, one beep every second of time.

2.7.3 Interlocks – X-Ray Emissions

The MINI Z scanner has several mechanical interlocks:

- A key on the scanner housing for main scanner power on/off (see Figure 2-6)
- Two trigger buttons on the scanner handle, wired in parallel; at least one button must always be pressed down in order for X-rays to be emitted (see Figure 2-6)
- In the interior of the scanner, Mechanical Interlock 1 ensures that all primary X-ray shielding is in place before X-ray emissions are enabled.

- In the interior of the scanner, Mechanical Interlock 2 ensures that the scanner exterior housing is in place.
- During initialization, after the control circuitry has been powered, a trigger button must be pressed to ensure user presence before the power to the X-ray generating circuits is connected.
- If the scanner has entered Standby mode (such as from interruption of communication with the tablet, or from time-out) a trigger button must be pressed to wake-up the scanner from Standby mode.

The MINI Z has software and electronic interlocks, and time-outs:

- The tablet and the scanner must be in established communication before any emissions can be generated, and at all times while emissions are occurring. If the interconnection is lost at any time for more than two seconds of time, the scanner main power is automatically sent into Standby mode.
- The X-ray generator wheel must reach a minimum speed before emissions are enabled.
- The tablet must be set to the **Scan** screen (or to one of the two Status screens) and the Scan Enable button  (upper area of the screen) tapped to On (full color image in the button, with dark blue background) before X-ray emissions are enabled, and then a trigger button on the scanner must be pressed within 35 seconds of time to allow emissions to occur.
- At least one of the two trigger buttons on the scanner handle must always be pressed down in order for X-rays to be emitted.
- Regardless of the state of either of the two trigger buttons, the system has a built-in timeout, limiting X-ray emissions to a maximum of 30 seconds before emissions are automatically stopped. If the trigger buttons are pressed again within 30 seconds, a new scan starts, and the 30-second clock is reset. To restart emissions, both of the trigger buttons must be released and then one or both must be pressed and held again.
- Regardless of the state of either of the two trigger buttons, if the tablet **Scan** screen Scan Enable button  is tapped while X-rays are being emitted, X-ray emissions are immediately stopped.

Figure 2-6: Keyed switch lock and the two trigger buttons on rear surface of the scanner handle

2.7.4 Calibration Dock

Calibration and Warmup of the system require the generation of X-rays. Whenever performing these functions, the Calibration Dock is required to receive the scanning surface of the scanner unit. The Calibration Dock has two critical safety features:

- **Collar** – The indented area on the top of the Calibration Dock is specifically designed to entrap any stray radiation. Always ensure the Scanner is fully inserted into the Calibration Dock.
- **Beam Blocker** – The interior of the Calibration Dock contains a dense shield that prevents the X-rays from penetrating the Dock. Ensure that only a Dock with black metal frame is used with the 120kV system. (The Docks with silver metal frame are designed for the 70 kV systems only.)

Figure 2-7: Calibration Dock application. (1) The MINI Z face is the section at the front of the scanner. (2) Alignment collar in the dock. Place the dock on a horizontal surface, with the four mounting feet downward. (3) Seat the Scanner Unit face down into the dock, making sure the front face of the face rests uniformly against the inside of the dock mounting collar.

WARNING

X-rays penetrate solid objects. It is good practice never to place personnel or hands or feet in the path of the X-ray beam. This includes when using the Calibration Dock. In particular, when placing the Calibration Dock on a work table, personnel should not sit at the table, so the legs and feet of the operators cannot be exposed to any potential for stray radiation.

120 kV 70 kV

Figure 2-8: Calibration Dock application. Frame color indicates X-ray power blockage rating. This system requires 120 kV blockage rating (black frame).

2.7.5 Pre-Operation Area Check

WARNING

Before operating the system, read and thoroughly understand radiation warnings and safety precautions described in Chapter 2, System Safety.

The following is a list of tasks that should be performed before operating the system. Before every scan, take into consideration:

- All persons in the area must be aware of the presence of the X-ray system.
- Avoid having persons on the opposite side of the object being scanned.
- The ground or floor surface where the users will stand should be clear and dry, and free of obstacles or debris.
- Plan the path for scanning the object, taking into consideration:
  - Scan path extents and direction (clear obstructions and position the object to optimize access by the scanner).
  - Appropriate hand placement to allow free movement throughout the scan.
- Appropriate foot placement to allow balanced movement throughout the scan.
- Consider using two users (one to scan, the other to monitor the tablet) if the scan presents difficulties.

2.7.6 Pre-Operation System Check

CAUTION

Damage to the system can occur if proper precautions are not taken to ensure proper operation.

The following is a list of tasks that should be performed before operating the system. On a daily basis, before turning on the system, make sure:

- The Ethernet interconnection data cable, if used, is seated tightly into plugs and insulation is in good condition.
- Scanner battery and tablet are fully charged.
- The scanner housing is clean and sealed, with no indication or signs of misuse or abuse.
- The users are properly trained in the use of the system.

The scanner system immediately performs a self-diagnostic test, and several additional safety interlocks must be verified automatically before the system is enabled to emit X-rays.

- Check status indicator LEDs (Table 4-2) for results of BIT tests.

In addition to checks before the system is turned on, the user should evaluate the performance of the system as it powers-on:

- Unusual noise or vibration in the motor assembly could indicate that consulting with AS&E Field Service is appropriate.

2.7.7 Pre-Operation Scan Path Planning

The MINI Z™ system is designed for close-quarters maneuvering near objects being scanned, particularly in confined spaces or zones where stationary X-ray systems cannot be used. However the MINI Z produces an open X-ray beam, and careful preparation must be made to ensure the directed beam of the MINI Z emission is never swung toward people or other living creatures, such as when going around corners or rounded objects, or by penetration through the objects being scanned.

WARNING

When using the Ethernet cables to interconnect the scanner unit with the tablet or the external detectors, be careful to provide strain relief at the connections, and to avoid stepping on or tripping over cables.

Before beginning each scan, review the scan path:

1. Ensure that:
   - a determination has been made and completed for the best handling of the tablet and scanner unit,
   - a determination has been made and implemented with regard to operation by either one or two users, and
   - a scan path exists that can be safely executed.
2. Position the scanner:
   - with the face (emitter front) end toward the object to be scanned,
   - at the top end of the scan path (left end for horizontal scans),

- with the bottom surface of the scanner perpendicular to the scan path, and
- with the face (emitter front) end parallel to the plane of the scan path.

WARNING

AS&E recommends that the scan path be planned so that the front of the scanner can be within approximately four to six inches (10-15CM) of the surface being scanned. This provides flexibility for positioning while minimizing the dispersion of backscatter around the scanner detectors.

3. Position both hands on the handle, taking into consideration the motion required to complete the scan path. Make a practice sweep through the entire scan path. Note: Ensure that feet and hands are clear of the scan path by a wide margin.
4. Review the posture and positioning shown in Figure 7-1 and Figure 7-2.

Chapter

3

Introduction

This chapter provides a broad overview of the MINI Z™ Handheld Z Backscatter®X-ray screening system.

3.1 General Description of the System

The MINI Z system basically is an X-ray scanner unit and a tablet computer that controls the scanner unit and captures and presents images received from the scanner. The main components are shown in Figure 3-1. The standard scanner unit provides the AS&E signature Z Backscatter technology, and the multimode scanner unit will be extensible with future features.

Figure 3-1: MINI Z System (typical)

The MINI Z system produces a near real-time photo-like image of the scan target. Z Backscatter (Bx) X-ray images highlight low-Z-effective materials, which are primarily composed of low atomic number elements (Hydrogen, Carbon, Nitrogen, and Oxygen). Bx imaging highlights organic materials that traditional transmission X-ray systems can miss, such as explosives, currency, and drugs.

The MINI Z system completely self-contained: no fixture installation is required. The components are light and compact enough can be carried by single operators, enabling immediate operation. As the operator scans a target, an image appears in real time on the system tablet. The tablet-based graphical user interface provides simple operation and management of the scan data.

WARNING

The tablet and the scanner unit are not shock resistant or water resistant. Do not drop the equipment and do not strike the equipment with hard or sharp objects.

For an overview of scanner and tablet controls, see Chapter 4, System Components.

The MINI Z system is safe for operators, bystanders, and the environment. The system's X-ray dose conforms with applicable ANSI, ICRP, NCRP, and EURATOM radiation safety standards. Although the MINI Z system is a low-energy and low dose Z Backscatter system, it is not designed to scan people. The MINI Z system must be used in accordance with the manufacturer's instructions and applicable laws and regulations.

The tablet and scanner unit can communicate wirelessly via WiFi, in either 2.4GHz or 5GHz bands. An Ethernet cable is provided for use in medical facilities or secure facilities where WiFi is not allowed, or for noisy WiFi environments where the signal is too weak.

3.1.1 Unpacking the System

The MINI Z is shipped in a rugged transport case, along with accessories. The layout of the case is shown in Figure 3-2. The contents are described in Table 3-1

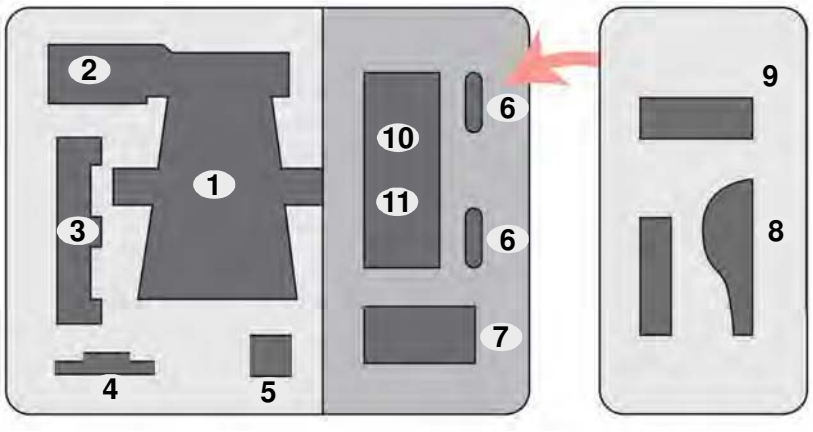


Figure 3-2: Packing in Rugged Transport Case. Content keys explained in Table 3-1.

Table 3-1: MINI Z System Contents Packing (typical)

Description	Image
Rugged Transport Case, with half-depth foam insert included. **Getting Started Guide** and **Quick Start** included.	
1. Scanner with key	

Table 3-1: MINI Z System Contents Packing (typical) (continued)

Description	Image
2. Scanner Shoulder Strap	
3. Calibration Dock, 120 kV rated	
4. Tablet	
5. Tablet charger power adapter with power cord	
6. Scanner batteries (2), each with shipping covers	
7. Hand Strap and Stylus for Tablet	

Table 3-1: MINI Z System Contents Packing (typical) (continued)

Description	Image
8. Scanner battery charger	
9. Scanner battery charger power adapter with connector cord	
10. Scanner charger power cords for US, UK, and EU mains	
11. Ethernet cable; scanner unit (M-12) to tablet (RJ-45)	

3.2 Power Connections

The tablet and the scanner unit are operated using battery power. AC electric power chargers for the batteries must be connected for charging the batteries before use. Connecting battery charging components is illustrated in Figure 3-3 and Figure 3-4.

CAUTION

It is highly recommended to fully read and understand the battery handling chapter (Section 12.4) before proceeding.

In particular, do not install or remove the tablet main battery pack while:
• the AC adapter is connected, or
• while the tablet is in Sleep mode. Removal of the battery pack in Sleep mode causes unsaved data to be lost and can cause the tablet to malfunction.

3.3 Data Connections

The tablet and the scanner must be interconnected by a data link in order for the MINI Z system to function. The communications link can be connected wirelessly using WiFi, or by an Ethernet cable for facilities where WiFi is not allowed. WiFi connections are illustrated in Figure 3-3, and Ethernet cable connections are illustrated in Figure 3-4.

Figure 3-3: Quick Connection Guide (Not Using Ethernet Cable). (1) Assemble scanner battery charger and charge the scanner battery, then insert the charged battery into the scanner, (2) Insert battery into tablet, and assemble tablet battery charger and charge the tablet battery, (3) Push the Power button on the tablet; on the scanner, insert the key and turn toward (|) to power-on.

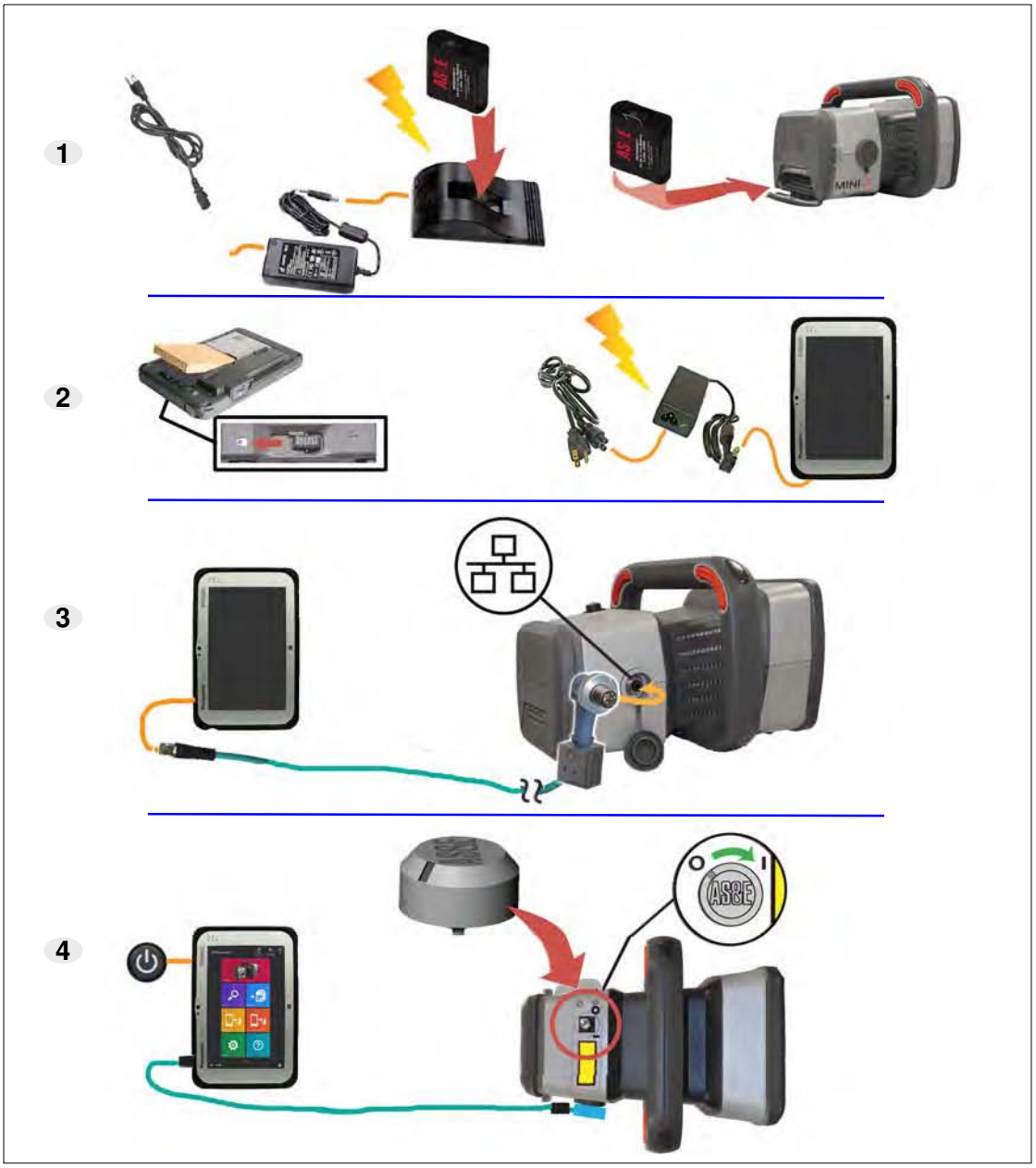


Figure 3-4: Quick Connection Guide When Using Ethernet Cable. (1) Assemble scanner battery charger and charge the scanner battery, and insert the charged battery into the scanner, (2) Insert battery into tablet, and assemble tablet battery charger and charge the battery, (3) Connect Ethernet cable between tablet and scanner, (4) Push the Power button on the tablet, and on the scanner insert the key and turn toward (|) to power-on.

A scanner unit can connect to only one tablet at a time, although the scanner can connect to any MINI Z tablet of a compatible release level. A tablet can connect to only one scanner unit at a time, although the tablet can connect to any scanner unit of a compatible release level.

Either interconnection option allows the system to be operated by either one or two users. In the case of two users, one user can view the images in real time and direct the other user, who would be moving the scanner. The communication link between the scanner and the tablet must remain in effect throughout scanning.

Interconnection requires the following:

- Ethernet cable option (Section 3.3.1). The system automatically detects the presence of the cable, and configures itself to use the cable.

  To confirm that the Ethernet cable is being used by the system, the interconnect button in the Status bar at the bottom corner of the screen shows a cable symbol (for location, see Table 3-2).

- WiFi wireless option (Section 3.6.3). No additional hardware is required, but the user must configure the scanner to comply with local wireless communications regulations and then select a connection to a specific scanner and frequency band.

  To confirm that WiFi is being used by the system, the interconnect button in the Status bar at the bottom corner of the screen shows the WiFi symbol  (for location, see Table 3-2).

3.3.1 Ethernet Cable Connection

On the scanner side, the Ethernet cable terminates in a right-angle M12 plug with a threaded ring fastener, to ensure continued connection while manipulating the scanner during scans. The Ethernet cable terminates on the tablet side with a standard Ethernet RJ-45 male clip connector.

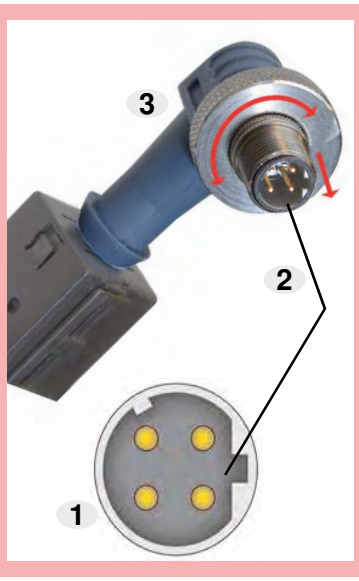
Figure 3-5: Ethernet Cabling Assembly (typical example). (1) Male Ethernet RJ-45 clip, (2) Ethernet right-angle (M12) plug with threaded ferrule.

CAUTION

The right-angle (M12) Ethernet connector at the scanner housing is composed of four pins and a free-spinning threaded ferrule (shown in the figure at right). To ensure proper polarity and to avoid damaging the pins, the connector is designed with alignment surfaces inside of the connector.

(1) Be sure to first properly align the surfaces to the socket on the scanner, and then (2) fully insert the pins into the socket before (3) threading the ferrule.

Do not start threading the ferrule before fully inserting the pins. Do not force the pins into the socket by threading the ferrule. Damage to the pins could result.



To set up the Ethernet link, perform the following steps:

1. Connect the Ethernet plug into the Ethernet port on the right side of the scanner housing.
   a. Remove the tethered cover of the Ethernet port.
   b. Align surfaces inside of the Ethernet angle plug (cable) and socket (scanner).
   c. Insert pins fully into the socket.

d. Screw-on the ferrule.

2. Connect the other end of the Ethernet cable to the Ethernet port on the tablet side (see image at right: top shows port cover open, bottom shows port cover closed).

3. To confirm that the Ethernet cable is being used by the system, the interconnect button in the Status bar at the bottom of the screen shows the Ethernet cable symbol (see Table 3-2).

Setting up the WiFi connection requires use of the tablet controls and the tablet and scanner to be powered. The local WiFi regulations are selected in the initial configuration (Section 3.6.3.2). The scanner connection in WiFi must be selected each time the tablet (and scanner) is powered on, so for some applications, using the Ethernet cable configuration can save time.

3.4 Using the Tablet

This section describes the basic operational requirements of the tablet.

CAUTION

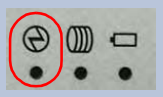
Do not apply excessive pressure to the touchscreen or to the frame around the touchscreen.

Do not hold the tablet with multiple fingers of your hand on the touchscreen at the same time. The tablet interprets this as excessive input and can lock up, with the touchscreen becoming unresponsive. If this occurs, on the side of the tablet, press the Power button until the tablet shuts down (the Power LED indicator extinguishes), and then restart the tablet by pressing the Power button until the Power LED indicator illuminates again. (NOTE: This application of the Power button should be used only in emergencies, not for normal powering-off the tablet.)

3.4.1 Powering-On the Tablet

To power-on the tablet, on the side of the tablet, press and hold the Power button for less than 2 seconds of time, then release it. The tablet initializes. A total of approximately 30 seconds elapse before the application screen opens.

When starting or awakening the tablet, on the front of the tablet, observe the Power LED (circled at right), and release the Power button as soon as the Power LED illuminates. Then wait for the tablet to initialize.



When starting or restarting, do not hold the Power button for longer than 4 seconds. The tablet will switch off again. This is a safety feature, to prevent the tablet from being turned on by accident, such as when placed in a briefcase or clothing pocket.

Do not press the Power button multiple times.

When starting or awakening the tablet in cold temperatures, there can be a delay while the solid state drive warms up. If the screen displays “Cannot warm up the system,” turn off the tablet, bring it to a warm location (5°C [41°F]) for approximately one hour, and then try again.

To resume from Power-saving mode, or Sleep mode (resume at the same screen as was displayed when the tablet entered Power-saving or Sleep mode):

- From Sleep mode:
  a. Press the Power button and release quickly. The Welcome screen opens (time and date displayed in large characters).
  b. Swipe upward to clear the Welcome screen. The login screen opens.
     - **ScannerUser** is displayed if the current account is an ASEInspection account
     - **Admin** is displayed if the current account is in Windows operating system
  c. Login:
     - If **ScannerUser** is displayed, no password is required. Tap the **Login** button.
     - If **Admin** is displayed, tap the Password entry text box to open the onboard keyboard and type the login password, then tap the Enter button →.
- From power-saving mode (operates in Windows operating system):
  a. Press the Power button and release quickly. The Welcome screen opens (time and date displayed in large characters).
  b. Swipe upward to clear the Welcome screen. The **Admin** login screen opens.
  c. Tap the Password entry text box to open the onboard keyboard and type the login password, then tap the Enter button →. Windows operating system opens to the screen that was open when Power-saving mode was entered.

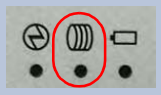
When the tablet awakens from Sleep mode while in Windows operating system and the ASEInspection service version is open, the tablet opens ASEInspection without separate ASEInspection login. To protect against unauthorized operator access to ASEInspection, after completing configuration tasks, the user should power-down the tablet.

3.4.2 Powering-Off the Tablet

To power-off the tablet:

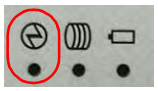
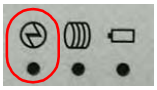
- Do not use the Power button on the side of the tablet to power-off the tablet. Holding the Power button for longer than 4 seconds forces an immediate power-down. This may interfere with proper shut-down procedures inside the tablet and should be used in emergencies only.

Avoid powering the system off or removing the battery when the solid state drive is being accessed, indicated by the Disk Access indicator illuminating (circled at right).



- To exit from the ASEInspection application, tap the Back button to return to the Home screen, and then tap the **Exit** button . This closes ASEInspection, and shuts down the tablet safely and completely.
- **Sleep Mode** – To enter Sleep mode immediately, press the Power button for approximately 1 second of time (this applies both for when in ASEInspection or when a supervisor account is using the Windows operating system).

  Sleep mode is entered automatically after 2 minutes of inactivity, when the tablet is in the ASEInspection (normal operation) mode.

  In Sleep mode, the tablet continues to draw power and deplete the battery. If using Sleep mode for a long period of time, consider connecting the AC Adapter. While Sleep mode is active, the Power indicator  on the tablet front flashes every 2 seconds of time.
- **Power-saving Mode** – Power-saving mode is entered automatically after 5 minutes of inactivity, when the tablet is in the Windows operating system mode. In Power-saving mode, the tablet continues to draw power and deplete the battery. While Power-saving mode is active, the Power indicator  on the tablet front flashes every 2 seconds of time.

More About Power-saving and Sleep Modes

The tablet does not enter Sleep mode or Power-saving mode if the AC adapter is connected and powered.

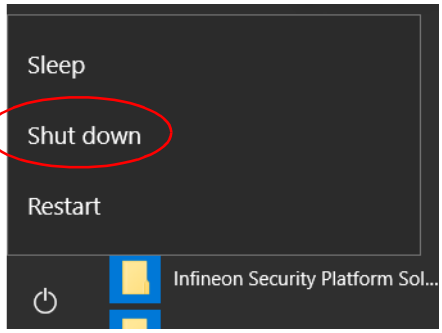
It is not recommended to use Sleep mode or Power-saving mode continuously. The tablet should be powered-off and restarted routinely, at least once a week.

The tablet may not resume from Sleep mode or Power-saving mode when a device is in the USB port. Simply remove the device and the process continues. It may then take a longer time than normal to shut down.

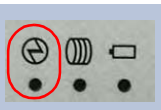
- If using a supervisor account to work in the Windows operating system (when setting system parameters), to shut down the tablet:

1. Press the Windows Start button  on frame outside of the touchscreen. The Windows Start menu opens.

2. On the menu, tap the Power button (circled in the image above). A menu opens.



3. Tap the **Shut down** listing. The tablet powers down completely.

To verify the tablet is completely shut down, observe the Power indicator  on the tablet frame outside of the touchscreen. If the Power indicator flashes every 2 seconds of time, the tablet is in Sleep mode or Power-saving mode, and has not completely shut down.

Store the scanner and tablet securely. Consider recharging the batteries.

3.4.3 Using the Touchscreen

The ***touchscreen*** (the tablet display screen) is a tactile interface that can be operated using a human finger, or the included stylus (for information on the stylus, see Section 3.4.6).

CAUTION

Do not use sharp or abrasive objects on the touchscreen.

Liquids and metallic or magnetic objects on or near the touchscreen may affect it.

Sensitivity of the touchscreen can be adjusted (Section 3.7.5) for the following conditions. A supervisor account is required:

• The tablet is rated as glove-compatible, but use of gloves depends on the type of glove. Gloves specifically designed for touchscreen use are recommended.

• Liquid droplets on the touch screen can interfere with screen operation. If a wet screen fails to respond, put the tablet in Sleep mode, wipe off the liquid, and then wakeup the touchscreen. If necessary, reset the touchscreen by pressing the Windows Start button  on front of the tablet beside the touchscreen.

Droplets on the screen can cause the screen to jump, including when the droplets are not near where finger gestures are being made. Any liquid droplets should be removed.

• Sensitivity to stylus touches and finger touches can be set.

The touchscreen is factory-set for both finger touch and stylus. If the touchscreen fails to respond to either finger touch or stylus, use the procedure described in Section 3.7.5 to ensure those sensitivities have not been inadvertently disabled.

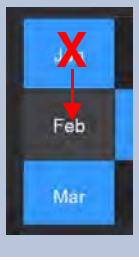
Areas of the screen, referred to as ***touch points***, are programmed to respond to a touch, and may appear as buttons, graphics, headers, or text. (Some objects that appear similar, are for display only, and nothing happens when they are tapped. These are referred to as ***icons***,)

The Windows tablet operating system can leave recently-used command buttons partially highlighted with a muted back ground, such as: medium gray for a normally black button, and light blue for a normally light gray button.

This is a system feature of Windows, and has no effect on the status of the button.

A ***thumbnail*** touch point is a small version of an image that serves not only as a visual reference, such as in a gallery view, but can also serve as a command button.

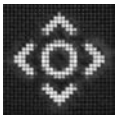
When alternatives are displayed at the same time, try tapping the current position of the marker, instead of tap-and-dragging the slider or spinner The marker moves into the alternative position.



The ***on-screen keyboard*** opens when a touch point that can accept text is tapped. The keyboard can be closed at any time by tapping the “X” button in the top corner. It will reopen again whenever a text touch point is tapped. To lock capital letters, double-tap an upward arrow button.

Figure 3-6: On-screen Keyboard. Title bar mode icon circled.

By default, the keyboard is docked (frozen in position) at the lower side of the screen. When docked, the Title bar mode icon shows the keyboard floating (interior box free from sides ); tap to enter floating mode. If the mode icon has changed to  (interior box touching sides), the keyboard is in floating mode, tap to go to docked mode).

The keyboard can be moved when floating. When the keyboard enters floating mode  , a "compass" button  also appears on the keyboard Title bar. Tap and drag this button to move the keyboard.

In addition to the touchscreen, there are several buttons on the side of the tablet. For more information, see Section 4.3, Tablet Controls.

3.4.4 Screen Rotation

The tablet allows the user to work with the screen oriented in landscape or portrait orientation. This can help with gripping the tablet and in orienting the images when viewing, so the screen objects always appear rightside up relative to gravity. The two orientations are shown in Figure 3-7. When rotation of the screen is not locked, to change orientation, simply hold the tablet with the touchscreen vertical, and rotate the tablet sideways a quarter of a circle.

The touchscreen side swiping locations also change, to match. For example, swiping in from the right side of the screen would be done from the narrow side of the tablet in landscape mode, but from the long side in portrait mode..

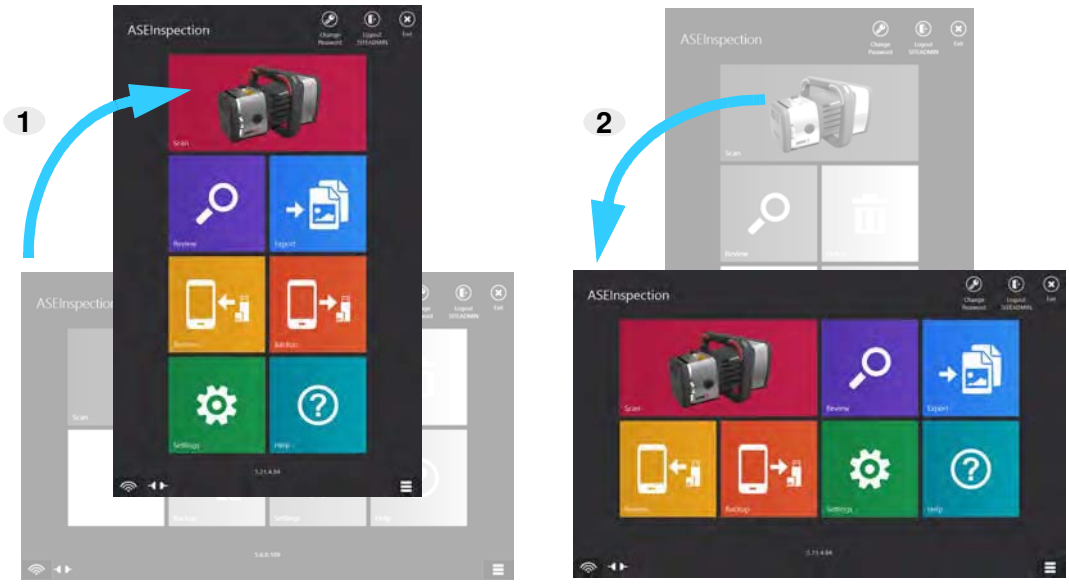


Figure 3-7: Rotating the tablet display by rotating the device: (1) from landscape to portrait, or (2) from portrait to landscape.

The tablet is typically enabled to automatically rotate screen view between portrait and landscape orientations to match how the operator is holding the tablet. Locking the rotation may be useful, for example when the user is in a constrained area and cannot hold the screen properly. Examples are provided in Figure 3-8.

Screen Locked in Portrait Orientation

Screen Unlocked; Automatic Rotation

Figure 3-8: Rotation Locking. (Left) Rotation Locked; screen orientation remains the same regardless of tablet orientation. (Right) Rotation Unlocked; screen orientation changes to align to the Earth's gravity regardless of tablet orientation.

The lock can be toggled on and off using the Screen Rotation Lock button  on the side of the tablet.

To use the button to interactively choose and then lock the screen rotation:

1. Press the Screen Rotation Lock button  until rotation is enabled.
2. Rotate the tablet until the screen is in the desired orientation.
3. Press the Screen Rotation Lock button  again, to lock the position.

When the tablet is powered-on or resumes from Sleep mode or Power-saving mode, the screen rotation remains at the last orientation before entering the suspended state. It then quickly adjusts to the current orientation if automatic rotation is enabled.

3.4.5 Hand Gestures

The tablet interprets ***gestures***, that is, finger touches performed in a certain manner or sequence. The exact response behavior depends on the context, and are described in the corresponding sections of this manual. Common gestures are defined as:

- Tap – A quick, single impact of the fingertip. Use to select and sometimes to execute a command. (Note: Whether a single tap or a double-tap is required is often a matter of context. If a single tap does not initiate an action, try a double-tap.)

For the tap gesture, very quickly remove the fingertip from the touchscreen after contact. If the finger remains on the touchscreen for too long, it is interpreted as a hold gesture and the expected action may not occur.

- Double-tap – Two quick impacts of the fingertip, on the same touch point, in rapid succession. Use to select a touch point and immediately execute the related command. In some cases, the system performs a function after the first tap, and the user should delay the second tap slightly.
- Hold or Press – Placing the fingertip on a touch point, and letting it remain there.
- Swipe – A slow touch and drag of the finger across the edge of the touchscreen to or from the edge. Not required in ASEInspection Software, but is used in Windows. Use to:
  - Pull a screen off of the touchscreen to hide it. To do so, start in the screen and swipe on to the edge.
  - Pull a menu that was hidden off of the touchscreen onto the touchscreen. To do so, start on an edge (off of the touchscreen) and swipe into the touchscreen.
- Flick – A quick touch, very short drag, and lift of the finger. Use with a lengthy list, by flicking along the length of the list. The list entries will rapidly slide through the screen.
- Drag – A touch-and-hold, and then moving the finger along the touchscreen without lifting the finger. Use to pan across images that are larger than can be displayed at one time. The hidden portions can be pulled into view.
- Two-Finger Tap – Tap with two fingers that are slightly separated. Use to zoom out to display the entire image.
- Spread (pinch out) – With two fingers that are slightly separated, touch and hold, and then spread the two fingers apart without lifting them. Use to enlarge (zoom into) images or screens. The image zooms using the midpoint between the fingers as the center point of the zoom.
- Pinch (pinch in) – With two fingers that are widely separated, touch and hold, and then close the two fingers together without lifting them. Use to shrink (zoom out of) images or screens. The image zooms using the midpoint between the fingers as the center point of the zoom.
- Press, Tap, and Drag (see Figure 3-9) – (1) press and hold with one finger: this finger must remain in contact with the screen throughout the gesture, (2) tap with another finger, then (3) drag with the initial single finger.

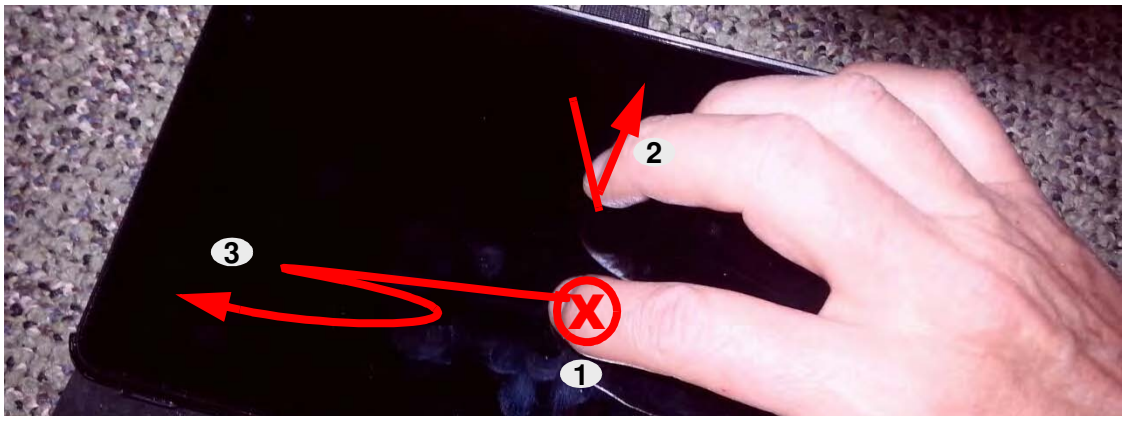


Figure 3-9: Press (1), tap (2), and drag (3) gesture.

When **Touch (Water)** touchscreen sensitivity is enabled, multi-touch input is limited to 2 points of simultaneous contact. Also, the Windows Start button on the touchscreen frame becomes disabled by default. See Section 3.7.5.

The screen may jump or wander when liquid is on the screen, including small amounts that are not close to the touch point. If the screen behaves erratically, try entering Sleep mode, drying the screen, and then waking up the tablet. Then reset the touchscreen If necessary, by pressing the Windows Start button on the touchscreen frame.

3.4.6 Using the Stylus

The stylus is a ballpoint pen-like passive device with a small point (Figure 3-10), allowing users to more quickly and precisely access smaller touch points, such as those typically found in some of the Windows operating system screens. A stylus can be used to tap and double-tap, and to drag and flick screens.

The tablet is shipped from the factory with a compatible stylus. In addition, the default tablet touch-screen setting is for both finger touch and stylus touch.

The stylus does not operate the Windows Start button, , or the mechanical buttons on the sides of the tablet.

Sensitivity to the stylus is set using the tablet Dashboard function (Section 3.7.6).

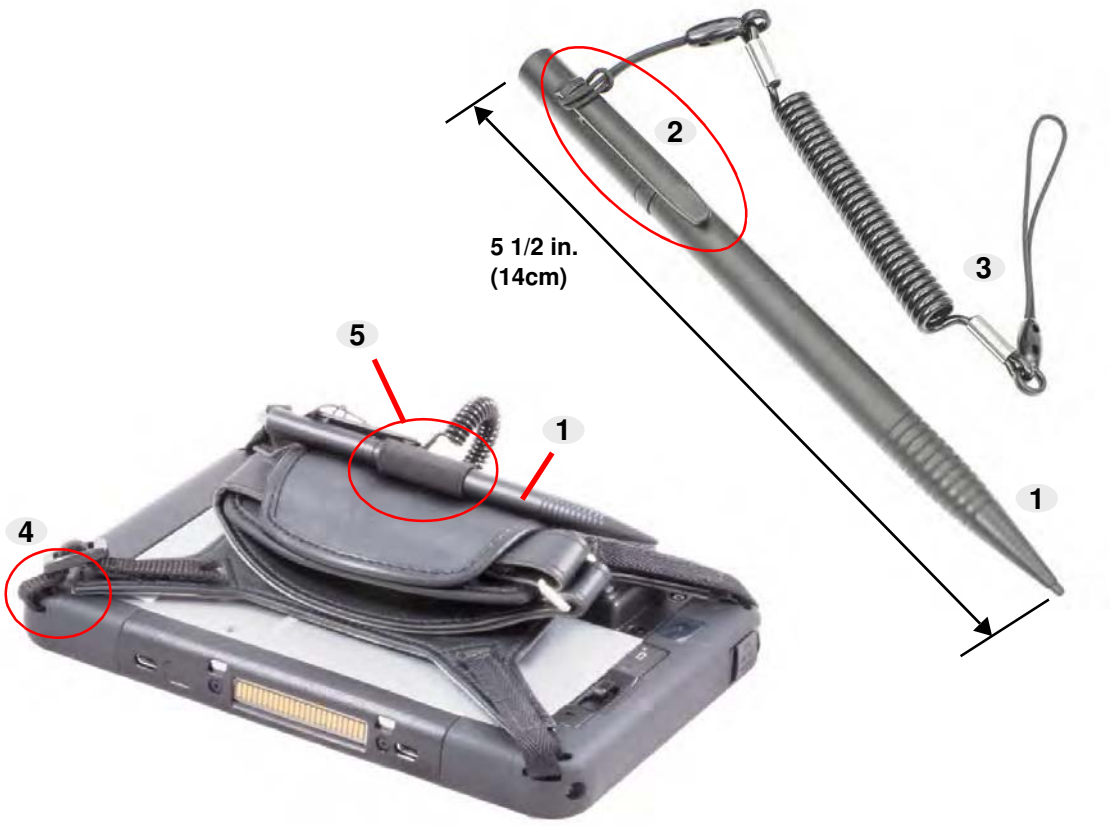


Figure 3-10: Stylus. (1) Stylus, (2) Pocket Clip, (3) Removable Attachment Loop and coiled tether. The loop can be placed through any of (4) the corner eyes on the tablet protective case. There also is (5) a sleeve for the stylus barrel on the hand grip. For mounting the hand grip, see Section 11.6.

3.5 General Screen Layout

The main screens in the ASEInspection™ Software have three primary zones (see Section 3.5):

- Navigation bar – Top of screen: buttons to return to previous screen or to move to other modes of the current screen
- Content pane – Middle of screen: image areas and command buttons
- Status bar – Bottom of screen: status icons and links to WiFi Connection and Status screens

To move between main screens, perform the following actions:

- Tap a button to open the corresponding screen. In the case where several related modes of top-level screens, text link buttons appear in the Navigation pane. Several top-level screen buttons are presented in the Content pane in the Home Screen.

For a map of the various main screens, see Section A.4

- To return to the Home Screen from another screen, tap the Back button , when it appears in the upper corner of a screen.
- Buttons in the content section (middle of the screen) may open ***flyouts***, subscreens that open over a primary screen to provide lists of data choices or selection buttons; for example, the keyboard. Closing the subscreen returns the operator to the previous primary screen.
- Tapping a selection in some cases closes a screen automatically; in other cases a confirmation button may be presented.

The image below is a composite from various screens
Not all elements appear in all screens

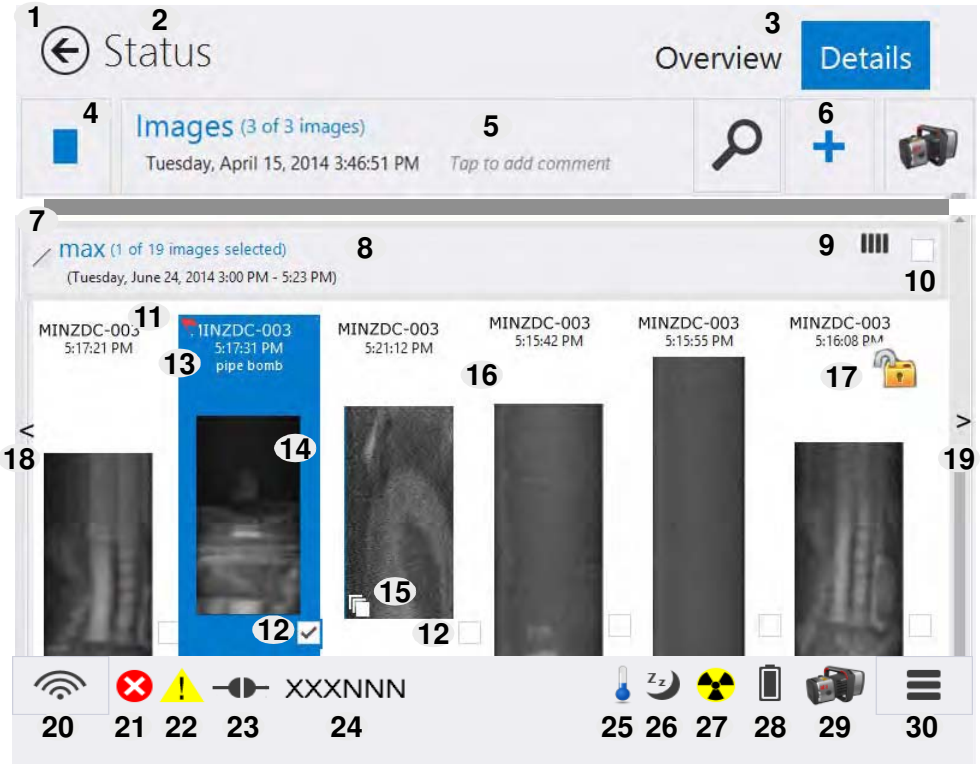


Figure 3-11: General screen layout for reference; see descriptions in Tables 3-2 to 3-4). Exact position may vary depending on set of icons displayed.

Table 3-2: Typical Screen Layout: Navigation Pane (top), see **Section 3.5**

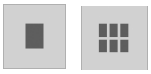
Key	Name	Function
1	Back button 	Tap to return to the Home Screen.
2	Screen title	Displays the name for the screen (may apply to several versions of the screen, which are accessed using the Screen Version Selection buttons)
3	Screen Version Selection buttons	Text labeled buttons, used to open versions of the current screen, such as for settings that require more than one screen.
4	View Mode Buttons 	In the Scan screens and Review screens, these allow switch from single image viewing to “gallery” views, with larger quantities of images, such as returned by searches in the database.
5	Selected Group Header	Location for identification and comments.
6	Command Buttons	Initiate major commands for a screen  indicates search,  indicates create or add new group,  indicates enable scan.

Table 3-3: Typical Screen Layout Description: Content Pane (middle), see **Section 3.5**

Key	Name	Function
7	Gallery Area Header Expand/ Collapse button 	Appears in screens where several groups of images are presented, and the images are arranged under headers. Tap this button (left example) to show or (right example) to hide the gallery area under the header.
8	Current Image Group Name and image sequence display	Depending on context, displays the name of the image group being shown, and the sequence number and creation date and time of the currently displayed images. (The name *Images* is the default group name.)
9	Multiple Images Group icon 	Indicates that the current group is a Multiple Image group. (See Section 7.2, Multiple Image Scanning (Manual Stitching).) Does not appear in the Review Search mode screen.
10	Select All check box	Appears on headers. Tap this check box to select all of the images displayed under this header, for Backup, Restore, or Delete functions. Depending on context, a Select All check box also may appear, at the top of the Content pane, allowing the selection of all of the headers (and the images) displayed in the screen.
11	Flag button or icon 	Depending on context, selects or indicates if an image has been flagged (red) or has not been flagged (black); used for ease of selection and for deletion protection. (See Section 7.5.4, Flags for Scan Images)

Table 3-3: Typical Screen Layout Description: Content Pane (middle), see **Section 3.5** (continued)

Key	Name	Function
12	Select image check box	Tap to select image in Backup, Restore, or Review-Delete screens. (See Section 9.10, Restoring Images) For Multiple Image groups, individual images cannot be selected and no check boxes appear here. Note: The check box may appear to be outside of the image itself (right example). To locate it more easily, tap the image to select it, providing a blue background that encompasses the check box (left example).
13	Image comment	Any user comments are displayed here. (See Section 7.5.3, Adding Comments to Scan Images)
14	Highlighted image	In the Scan Gallery mode screen or Review Search mode screen, tap a image thumbnail to select it, and then tap again to display it in full resolution in the Scan Monitor mode or Review View mode screen. Highlighting indicates the image has been selected.
15		Future feature placeholder
16	Gallery area	In screens where several groups of images are presented, the area under a header. If only one image or group is displayed, the corresponding images. For each image, identifying information is displayed: • Scanner serial number of the scanner that generated the image • Date scan was recorded
17	Lock button	In image viewing screens, can freeze to position or size of one or more scans. Click to toggle locked state.
18	Previous Scan button <	If bolded, indicates that there exists one or more previous scans. Tap to display the previous scan. • If a standard scan group is currently being displayed, indicates there exists one or more previous scans in the current standard image group. • If a Multiple Images scan group is currently being displayed, skips any standard scans and goes to the previous Multiple Image Scan group.
19	Next Scan button >	If bolded, indicates that there exists one or more subsequent scans. Tap to display the next scan. • If a standard scan group is currently being displayed, indicates there exists one or more subsequent scans in the current standard image group. • If a Multiple Images scan group is currently being displayed, skips any standard scans and goes to the next Multiple Images Scan group.

Table 3-4: Typical Screen Layout Description: Status Bar (bottom), see **Section 3.5**

Key	Name	Function
20	Interconnection Status button or icon: • WiFi Connection button  • Ethernet Connection icon 	Always visible. When WiFi is used for the interconnection to the scanner, appears with the WiFi symbol (upper example). Tap to open the WiFi Connection list to view available scanner WiFi connections and select the target scanner. (See Section 3.6.3, Setting up WiFi.) When button background is highlighted as dark blue, indicates the WiFi Connection list is open. When the Ethernet cable is used for the interconnection to the scanner (See Section 3.3.1, Ethernet Cable Connection.), appears with a cable symbol (lower example), and is an inactive icon.
21	Fault Status icon 	Appears when a fault condition has been detected. For information, tap the Status button on this toolbar to view the Status Overview Mode Screen, Faults section. Restart of the MINI Z system typically is required. A fault message may also appear, see Figure 7-10.
22	Warning Status icon 	Appears when a warning has been issued by the system. If the condition is resolved, this icon will again be hidden. For information, tap the Status button on this toolbar to view the Status Overview Mode Screen, Warnings section. A warning message may also appear, see Figure 7-10.
23	Scanner Connection Status icon 	Always visible. (Left example) Scanner and tablet are interconnected (by either Ethernet or WiFi), and (right example) not interconnected.
24	Scanner Serial Number icon	Appears when a scanner is connected and communicating with the tablet (data is read from scanner memory). Provides the serial number of the currently connected scanner. (See Section 3.6.3.4, Confidential SSIDs for Scanners.)
25	Warm-up Required Status icon 	Appears when the scanner X-ray generation elements require a warm-up (see Section 7.4, Operational Considerations). (Scanner must be interconnected to tablet to appear.)
26	Scanner Standby Mode Status icon 	Indicates that the scanner has timed-out and entered reduced-power Standby mode. (Scanner must be interconnected to tablet to appear.) Press and release a scanner unit handle trigger button to awaken the scanner unit.
27	X-ray Emission Status icon 	When visible, indicates that X-ray emission is occurring from the scanner. (Scanner must be interconnected to tablet to appear.)

Table 3-4: Typical Screen Layout Description: Status Bar (bottom), see **Section 3.5** (continued)

Key	Name	Function
28	Scanner Battery Status icon 	Indicates approximate percentage of scanner battery full charge: (left example) battery full, (middle example) battery approximately 60% of full. (Scanner must be interconnected to tablet to appear.) When the battery is critically low, and the battery should be replaced immediately, the icon is red color and flashes (right example).
29	Enabled Scanning Status icon 	Indicates scanner scanning enablement for scanning. (Left example) Full color version indicates that the scanner interlock has been enabled to emit X-rays. (Right example) Gray version indicates that the scanner interlock is not currently enabled to emit X-rays. (Scanner must be interconnected to tablet to appear.)
30	Status screens button 	Always visible. Tap once to open Status screens (see Section 5.9, Checking Status). If already in a Status screen, tap once to go back to previous (non-Status) screen. When button background is highlighted as dark blue, indicates a Status screen is open.

3.6 Initial Configuration

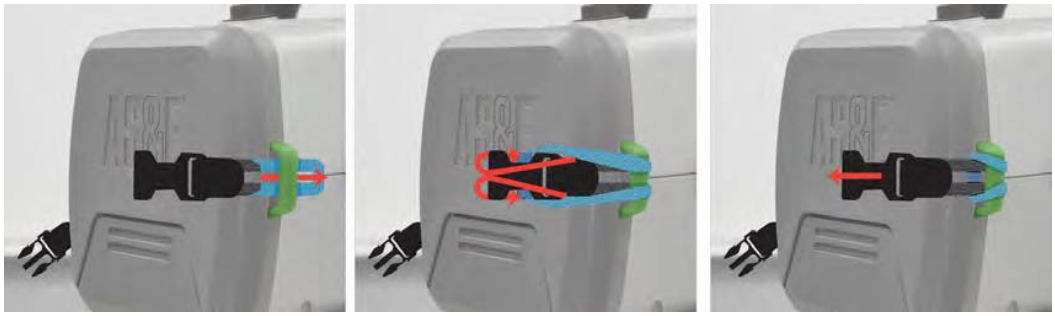
This section covers setup and configuration. For scanning operations, see Chapter 6, Scan Procedure. For an overview of scanner and tablet controls, see Chapter 4, System Components.

Some general configuration must be performed to gain access to the tablet and establish communications between the tablet and the scanner unit. Then additional configuration of the scanner can be performed.

3.6.0.1 Tablet Access

1. All users must read and understand this manual.
2. Unpack the system and check for damaged or missing parts (Section 3.1.1).
3. Connect the scanner shoulder strap. Mount the shoulder strap on the scanner by attaching each of the two tie point loops on the shoulder strap to the mounting eyes on the rear of the scanner housing, and then connecting the shoulder strap across those clips. For full details, see Section

11.5.

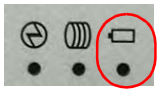


4. Charge the tablet and the scanner batteries (reference Figure 3-3 or Figure 3-4, for full details see Section 3.2).

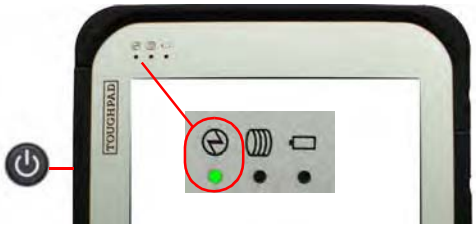
3.6.1 Initial Supervisor Account

A confidential password-protected supervisor account should be created. This account can be used to create operator accounts and perform system configuration.

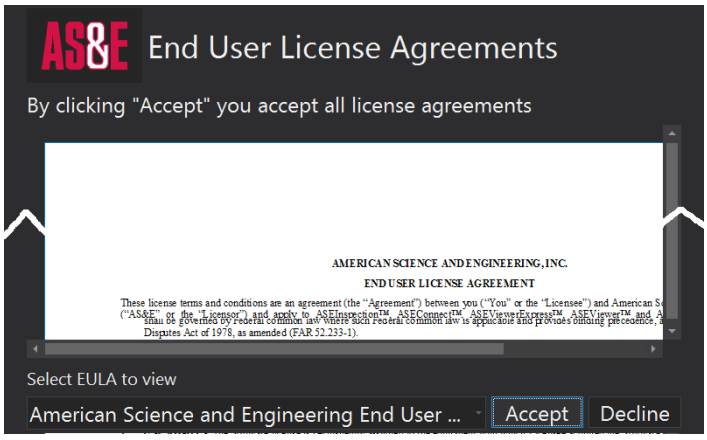
1. Ensure the tablet main battery pack is loaded, locked in, and that the battery power indicator LED displays green.



2. Power-on the tablet: on the tablet left side, press the Power button  until the Power LED indicator changes to steady green.



3. The **End User License Agreements** screen opens.



   a. Use the **Select EULA to View** button to open and read each license agreement.
   b. If in agreement with all of the license agreements, tap the **Accept** button to accept those terms and continue.

4. An initial supervisor login account is created with the user name SITEADMIN. A screen opens to set the password.

   a. In the **New Password** text box, type a new password.

If the system has been pre-configured for strong passwords, the password must include:
- 8 to 14 characters (case-sensitive)
- At least one upper case letter (A-Z)
- At least one lower case letter (a-z)
- At least one numeric character (0-9)
- At least one special character: @ ” ! # $ % ’( )* + , - . / : ; < = > ?[\ ]^ _`{ | } ~
- No more than two numbers together
- No character repeated together
- No three consecutive letters or numeric characters (whether in ascending or descending order)
- No blank spaces
- Not the account User Name (the login account identifier used in this system)

CAUTION

If necessary, consider making a temporary record of the password, in case the system times-out during set-up, or if the screen language setting must be changed (which requires a restart). If the password is lost, the system may have to be returned to the factory for reset.

b. In the **Re-enter Password** text box, type the identical password.

c. Tap the **OK** button to confirm the password. The ASEInspection Software opens to the Home screen (image at right).

Additional user accounts can be created by a supervisor account at any time. See Chapter 10.

3.6.2 ASEI Environment Configuration

There are several settings that affect the interactive behavior of the tablet. The following sections describe how those are set in ASEInspection (ASEI). These include specifying warnings and WiFi, as well as the appearance of the screen.

Before using the WiFi connection, the WiFi Region setting should be made using the Ethernet cable (so that no WiFi transmissions are made until after the WiFi Region is set).

Some of these settings require the scanner to be powered on and in communication with the tablet:

1. Ensure there are several bars on the scanner battery pack LCD (image below shows five bars, indicating a full charge), the pack is loaded, and the compartment door is latched.

2. Power-on the scanner unit: turn the key to the on position. The Power indicator LED displays steady green. If the Ethernet cable is not connected, the Status indicator LED displays

flashing yellow, indicating it is not connected to a tablet.If the Ethernet cable is connected, the Status LED should display steady green.

3.6.3 Setting up WiFi

If the Ethernet cable is being used to interconnect the system (see Section 3.3.1, Ethernet Cable Connection), skip this section. If the Ethernet cable is not being used and is not connected, the system enables the WiFi functions automatically.

If the Ethernet cable is being used, but becomes disconnected during operation, the system automatically attempts to reconnect using WiFi.

Operator access to WiFi can be enabled or disabled using the Windows Airplane mode. See Section 3.7.7.

For systems using the WiFi capability, the setup procedure is a three-stage process:

1. Use the tablet to connect to the scanner WiFi signal (from the various WiFi nodes that may be detected in the area) (Section 3.6.3.1).
2. Configure the scanner WiFi to comply with the regional government wireless communication regulations in the location of use (Section 3.6.3.2).
3. Select the WiFi frequency band (Section 3.6.3.3). If the WiFi 5.0 GHz frequency band is to be used, the tablet must be configured to detect that band (Section 3.7.4). The default 2.4 GHz frequency band always is available.

The two WiFi frequency bands indicate two groups of different channels that are selected automatically by the WiFi circuits for best performance and least interference. Areas that have a large quantity of WiFi nodes operating may experience greater levels of interference, and switching to a different band may eliminate the problem. In general the 5.0 GHz band has less overcrowding and higher speeds, but covers a shorter distance than a 2.4 GHz signal.

3.6.3.1 Connecting to the Scanner WiFi

To connect a scanner to the tablet by WiFi, perform the following steps:

1. Disconnect the Ethernet cable, if it is connected.
2. Confirm that the tablet is powered-on and the ASEInspection Software is open.
3. In the tablet, determine if the scanner WiFi connection is being detected:
   a. On any screen, tap the WiFi Connection button (bottom corner of the touchscreen).
   The WiFi Connection button opens the **WiFi Connection** list (Figure 3-12)

Figure 3-12: WiFi Connection list with a previously selected and connected scanner indicated. (1) WiFi Connection button (at bottom corner of all screens; highlighted background indicates that the list is open), (2) **Show all** check box (tap to show all WiFi nodes detected, including nodes that are not MINI Z systems and MINI Z scanners with confidential SSIDs), (3) **Disconnect** button (tap to remove a current connection before making a new connection); when the "X" icon in the corner is red, the highlighted selection is the scanner currently connected, and (4) list of detected WiFi connections.

• Scanners that have not been given a confidential SSID appear with the serial number "SN..." that appears on the label of the scanner unit.

Figure 3-13: Scanner Unit Serial Number Label

- Scanners that have been given a confidential SSID do not appear until the **Show all** button  is selected by being tapped (a check mark appears in the box).
- Non-MINI Z WiFi networks also are displayed, but should not be selected for linking.

Scanners that have been enabled for 5.0 GHz show “-5G” at the end of the listing name.

If the 5.0 GHz band has been selected, but the scanner unit does not appear in the WiFi Connection List, ensure that 5.0 GHz detection has been enabled in the tablet. See Section 3.7.4.

To close the WiFi Connection list without making any changes, tap the WiFi Connection button  . Do not tap the “X” icon at the top of the list. The “X” icon is part of the **Disconnect** button, and indicates if the highlighted scanner is connected (red X) or none is connected (gray X). Tapping a red “X” icon disconnects the scanner.

A MINI Z tablet can connect to only one scanner at a time. If the tablet is already connected to a scanner, the user must first disconnect that scanner, and then select and connect to the new scanner. To disconnect an existing WiFi link, when the WiFi Connection list opens, at the top of the list, tap the **Disconnect** button. When the “X” icon in the top corner of the list turns gray, no scanner is connected.

b. Tap the target scanner listing to select that scanner. The scanner row becomes highlighted, and the tablet starts connecting to the selected scanner. The status LED on the scanner (Table 4-2) remains flashing yellow while the units are connecting, and the Status bar on the tablet shows the no scanner connected  icon.

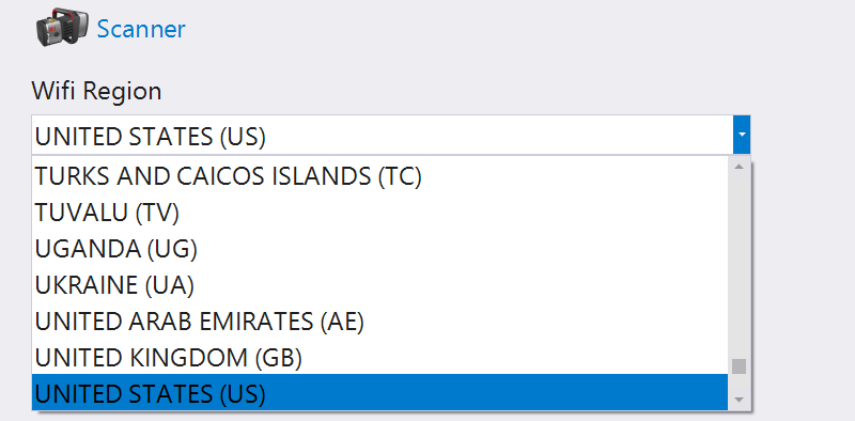
c. When the connection process completes: the status LED on the scanner turns steady yellow, the WiFi list on the tablet closes, and the Status bar on the tablet updates to show the scanner connected  icon.

3.6.3.2 Configuring the WiFi Region

The WiFi transceivers must be configured to conform to the local regulations for wireless transmission.

1. In the tablet Home Screen, tap the **Settings** button  . The **Settings** screen opens.
2. At the top corner of the touchscreen, tap the **General** button. The Settings General mode screen opens (shown in Figure 5-11).

3. To select a WiFi transmission standard, tap the **WiFi Region** text field. The WiFi Region list opens, displaying a list of WiFi jurisdictions



If the WiFi region list will not open, ensure that the Scanner is turned on and linked to this tablet

4. Locate the region corresponding to the current location, and tap that listing. The menu closes, and the listing is assigned.

3.6.3.3 Configuring the WiFi Frequency

The WiFi transceivers can be configured to use two alternative transmission frequency bands: the default 2.4 GHz band, and the 5.0 GHz band.

To detect 5.0 GHz band WiFi signals, the tablet must be set to detect that frequency range, as described in Section 3.7.4. When 5.0 GHz detection is enabled, the user can interactively choose between 2.4 GHz and 5.0 GHz using the procedure described in this section.

Selection between the two bands is done by the user and depends on local conditions and the use of the bands by other WiFi users. Selection is persistent between sessions, and is stored in the scanner unit. When the 5.0 GHz band is selected, "–5G" is appended to the SSID shown in the WiFi Connection List.

1. In the tablet Home Screen, tap the **Settings** button . The **Settings** screen opens.
2. At the top corner of the touchscreen, tap the **General** button. The Settings General mode screen opens (shown in Figure 5-11).
3. To select a WiFi transmission frequency range, tap the **WiFi Frequency** text field. A dropdown menu appears.

If the WiFi frequency range list will not open, ensure that the Scanner is turned on and linked to this tablet,by either WiFi or the Ethernet cable.

4. Tap the frequency range to use. The menu closes, and a message opens instructing the user to restart the scanner unit.
5. Restart the scanner unit by turning the key to the Off position (“O”) and then to the On position (“|”) again.

If the 5.0 GHz band has been selected, but that scanner unit does not appear in the WiFi Connection List, ensure that 5.0 GHz detection has been enabled on the tablet. See Section 3.7.4.

3.6.3.4 Confidential SSIDs for Scanners

When a WiFi-equipped system is powered-on, it seeks other WiFi nodes that are in range and provides a list of the available connections to the user. The user then chooses the link to be accepted. The connection is then identified by a Service Set IDentifier (SSID), an identifier that specifically identifies a WiFi local area network.

The SSID is assigned to the scanner unit and is stored in the on-board memory of the scanner unit. The default SSID is based on the scanner serial number, but a MINI Z tablet can be used to customize the SSID of a connected scanner, such as for hiding the identity of the scanner for security reasons. The tablet can be used to connect to a scanner unit and read the SSID whether it is the default SSID or a customized SSID.

Serial Number versus SSID

When the scanner unit is built at the AS&E factory, the serial number of the scanner unit is embedded in the scanner memory. The serial number uniquely identifies the scanner unit, and it matches the visible serial number marked on the label on the exterior of the scanner unit housing (Figure 3-13).

The scanner serial number also is used as the root for the default SSID of that scanner unit, in the format:

ASE_[***serialNumber***]

The prefix “ASE_” is imposed automatically by the tablet to help to identify scanners that have not been assigned a confidential SSID. When the **WiFi Connection** list is opened (see Section 3.6.3, Setting up WiFi), by default, only the scanners that have the ***ASE_*** prefix are displayed.

To view scanners that have had a confidential SSID assigned, when the **WiFi Connection** list is opened, at the top of the subscreen, click the **Show all** button  (Figure 3-12).

SSID Change Access

After the exclusive WiFi network connection is established between the MINI Z tablet and scanner unit, the MINI Z tablet can be used to change the SSID of the connected scanner unit. This allows the identity of the individual scanner unit to be disguised for security reasons. In addition, this can be used by site supervisors and operators to distinguish between the active scanner units that are physically located nearby.

Access to the tablet screen sections used to change SSIDs on the tablet is restricted to supervisor-level user accounts. Operator-level user accounts can only view SSIDs of active available WiFi networks, which is done when establishing a WiFi connection to a scanner unit.

If a custom SSID does not display…

The Microsoft Windows operating system that is used on the tablet blocks the display of the SSID if it includes certain combinations of special characters (that is, characters that are not standard numbers or letters). This is believed to involve a level of security in Windows itself.

If the operator loads a custom SSID on a scanner, and then the SSID does not appear in the WiFi Connections subscreen list, Windows security is the likely cause. The SSID simply does not appear in the list.

To fix the problem, the operator should create a different SSID, and check to see if it is displayed. The operator should always immediately check to see if a new SSID is displayed.

If the SSID does not appear, the operator cannot select it and so cannot connect the tablet to the scanner by WiFi.Therefore, in that situation, the operator must use the Ethernet cable to connect to the scanner to change the SSID.

To change the SSID of the connected scanner unit, use a supervisor-level user account on the tablet to perform the following steps:

1. In the tablet ASEInspection Software Home Screen, tap the **Settings** button  . The **Settings** screen opens.
2. At the top of the screen, if necessary, tap the **General** button. The **General** screen appears (see Figure 5-11).

3. In the **Scanner** table, locate the **WiFi SSID** row, and tap the **Change** button. A subscreen opens (Figure 3-14).

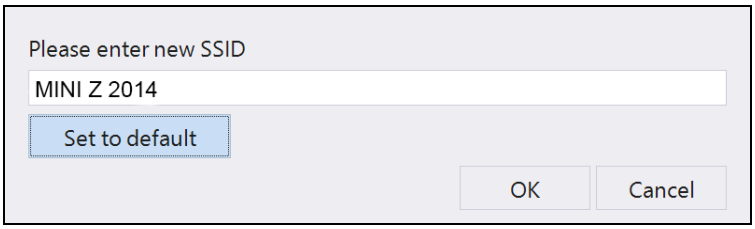


Figure 3-14: SSID Update Subscreen Showing A Default SSID. To change the SSID, tap the text box to open the on-board keyboard, type the new SSID, and tap the **OK** button. Instead, to restore the scanner unit serial number as the SSID, tap the **Set to default** button, then the **OK** button.

4. To reset the SSID to the connected scanner unit serial number, tap the **Set to default** button. Otherwise,
5. To create a new SSID, tap the text box. The on-board keyboard opens.
6. Type the new SSID.
7. Tap the **OK** button. A message subscreen states that a scanner unit restart is required to complete the SSID change.

In the on-board keyboard, tap the "**X**" button at the top corner to close the keyboard.

The operator should always immediately check to see if a new SSID is displayed.

3.6.4 ASEI Screen Background

The tablet can be used in various ambient light conditions. As an aid to viewing the screen, two skins (screen appearance color schemes), are provided with the MINI Z: a light background and a dark background. This can be changed by any user login account, at any time. This allows rapid response to changing use conditions. The setting remains until manually changed in this screen, or until the tablet is restarted.

1. In the tablet ASEInspection Software Home Screen, tap the **Settings** button  . The Settings screen opens.
2. At the top of the screen, tap the **General** button. The General screen appears (see Figure 5-11).
3. In the **Skins** option group, tap the icon with the background color preferred. The screens update.

3.6.5 ASEI Scan Image Export File Format

The tablet can be used to export scan images in industry-standard graphics files:

- JPG (JPEG) – Commonly used format that uses image compression to reduce file size.
- PNG – Commonly used format that retains all original pixels and may be larger than a similar JPEG file.

This selection applies to all exported files until changed again in this screen, or in the Scan Monitor Mode Screen, Review View Mode Screen, or Export Screen. The setting is retained when the scanner is turned off.

To change the file format used for exported image files, perform the following steps:

1. In the tablet Home Screen, tap the **Settings** button  . The Settings screen opens.
2. At the top of the screen, tap the **General** button. The **General** screen appears (see Figure 5-11).
3. In the **Image Format** option group, tap the button for the required format:
   -  (Note text: ***JPG***) Use JPEG format
   -  (Note text: ***PNG***) Use PNG format

This selection applies to all exported files until changed again in this screen, or in the Scan Monitor Mode Screen or Export Screen.

3.6.6 ASEI Audible Warning

(Requires a connection to the Scanner)

The MINI Z has one audible X-ray generation indicator. It consists of an audible beep.

The quantity of beeps can be configured to match local governmental regulations:

- **Normal** – At the beginning of an X-ray emission, one beep. At the end of an X-ray emission, two beeps. There are no beeps during the X-ray emission.
- **Extended** – At the beginning of an X-ray emission, five beeps. At the end of an X-ray emission, two beeps. During the X-ray emission, one beep every second of time.

To set the warning type, use a supervisor-level user account to perform the following steps:

1. In the tablet ASEInspection Software Home Screen, tap the **Settings** button  . The **Settings** screen opens.
2. At the top of the screen, if necessary, tap the **General** button. The **General** screen appears (see Figure 5-11).
3. In the **Scanner** table, tap the **X-Ray beep** drop-down box to open the list.
4. Tap the required option. The list closes. It is not necessary to restart the scanner.

3.6.7 ASEI Laser Guide Beams

(Requires a connection to the Scanner)

The MINI Z has two Class 1 red laser beams that can emit from the front of the scanner unit to allow the operator and bystanders to see the outer bounds of the direct X-ray emission beam (Figure 2-5).

The beams can be enabled for automatic operation whenever the scanner unit is emitting, or the beams can be kept turned off:

- **Enabled** – The laser beams are automatically illuminated during scanning.
- **Disabled** – The laser beams are not turned on.

To set the state, use a supervisor-level user account to perform the following steps:

1. In the tablet ASEInspection Software Home Screen, tap the **Settings** button  . The **Settings** screen opens.
2. At the top of the screen, if necessary, tap the **General** button. The **General** screen appears (see Figure 5-11).
3. In the **Scanner** table, tap the **Laser** drop-down box to open the list.
4. Tap the required option. The list closes. It is not necessary to restart the scanner.

3.6.8 ASEI Automatic Login

(Requires supervisor account)

When the system is shipped from the factory, the Automatically Login User feature (login without password) feature is enabled by default to allow a supervisor (SITEADMIN) account to open for system set-up. It is recommended that, during these initial procedures, the password policies be reconfigured so either no account, or at most an Operator-level account, can be logged in automatically when the system is turned on.

1. In the Home Screen, tap the **Settings** button  .
2. If necessary, at the top of the screen, tap the **Policies** button. The **Settings: Policies** screen opens.
3. To allow automatic login of a user account, in the **Automatically login user** group, tap the list box to open it, and then tap an Operator-level account (do not change the slider position, it should remain so the label indicates **On**). Otherwise,
4. To prevent any automatic login of any user account, in the **Automatically login user** group, change the slider position; it should moved so the label indicates **Off**.

3.6.9 ASEI Display Language

(Requires supervisor account)

To change the user language used in the tablet screens, perform the following steps:

CAUTION

Changing the language requires an automatic restart of the tablet. Ensure the initial login (SITEADMIN) account password is recorded.

1. In the Home Screen, tap the **Settings** button  .
2. If necessary, at the top of the screen, tap the **General** button.
3. In the **Language** group, tap the list box to open it.
4. Select the language required.
   A confirmation box opens in the target language. Tap the **OK** button.

   The tablet restarts in the target language. The screen objects are changed as necessary to match right-to-left and left-to-right languages.

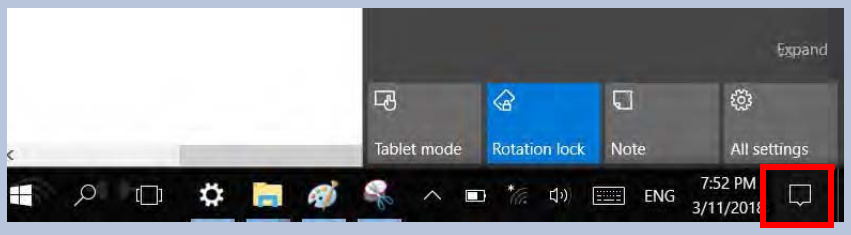
3.7 Configure Windows Environment

There are several settings that affect the interactive behavior of the tablet. This section describes those set in the Windows environment. These require a supervisor account to access the Windows operating system.

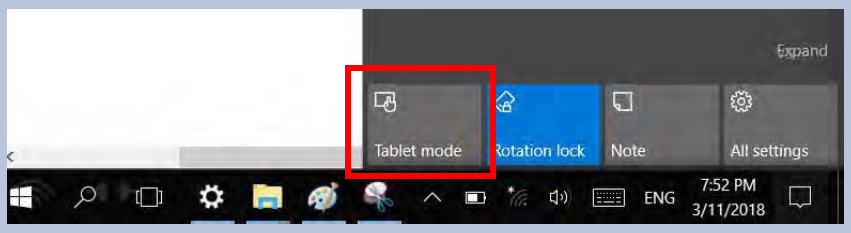
Do not change the size of the screen text, or the scaling of the screen, as this may affect the positioning of controls in the screen.

- For more information on Windows user accounts Admin and ScannerUser, see Section 7.6.1
- For more information on accessing Admin and ScannerUser, see Section 7.6.2

If a Windows utility does not open from the Desktop, but instead a side of the screen flashes, indicating a blocked application has been called, and the ASEInspection Home page opens, check that the tablet has not inadvertently been set to Tablet mode. To do so, in the Windows tool tray, click the Action Center button to open the **Action Center** subscreen.



In the **Action Center** subscreen, check the background color of the **Tablet Mode** button. If the background is blue, Tablet mode is active. Tap the button to toggle off Tablet mode (the background is gray when Tablet mode is inactive).



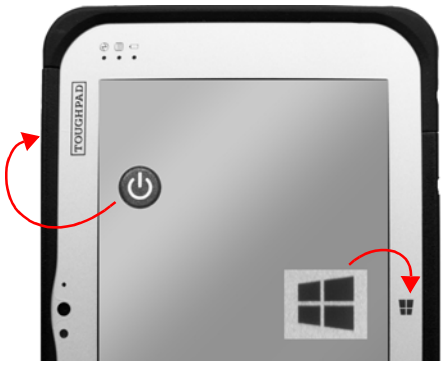
Access to other applications should now be enabled.

3.7.1 Accessing the Windows Operating System

When switching between the ASEInspection application environment and the Windows operating system, if the Windows desktop Welcome screen usually opens (identified by the large time and date display).To reach the login page, or the application, swipe upward until the Welcome page disappears.

To access the Windows operating system:

1. With an ASEInspection screen open, on the surface and left sides of the tablet, simultaneously press the Windows Start button and the Power button. A blue screen opens.



CAUTION

Before closing the AS&E application, make sure the initial account password is available.

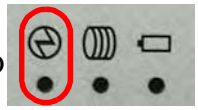
2. Tap the **Sign out** text link. The screen updates to a Welcome screen.
3. Swipe up to clear the Welcome screen.
4. At the bottom of the screen, account links appear. Tap the **Admin** text button. The screen updates and the **Admin** login fields appear.
5. Tap in the text field to open the virtual keyboard, and type: *asepassword* (no spaces, lower case letters), then tap the Enter button . The Windows Desktop opens.

CAUTION

This password provides access to the Windows operating system. Consider changing the password immediately after completing system set-up. AS&E recommends using a strong password (see Section 10.3).

3.7.2 Restoring Normal ASEInspection Mode from Windows Mode

To leave the Windows operating system environment and restore normal user account behavior (direct login to ASEInspection and direct shutdown when exiting ASEInspection), the simplest method is to cycle power to the tablet.

1. While in the Windows operating system environment, press the Windows Start button  on the frame outside the touchscreen. The Windows Start menu opens.
2. In the Power menu, tap the Power button  . A menu opens.
3. Tap the **Shut down** text button. The tablet saves data and shuts down.
4. On the side of the tablet, press and hold the Power button  until the Power Indicator LED  illuminates, and then immediately release the Power button. (If the button is not released promptly, the tablet will assume the button is being pressed by accident, such as by being held in a briefcase, and shut down again.)

When the tablet opens again, ASEInspection is displayed in normal operating mode.

Although it is not the preferred method, it is possible in an emergency to shut down the tablet by holding the Power button  until the Power indicator LED  extinguishes.

Using the Power button  is not recommended because it forces a shutdown when held until the Power indicator LED  extinguishes (about 4 seconds), and may interfere with tablet shutdown procedures.

If the Power button  is released before the Power indicator LED  extinguishes, the tablet enters Sleep mode, instead of shutting down. If Sleep mode is active, the Power Indicator LED flashes once every 2 seconds. While Sleep mode is active, the system continues to drain power from the battery.

To avoid the possibility of leaving the tablet in Sleep mode, the supervisor user can use the **Shut down** text button, as described above.

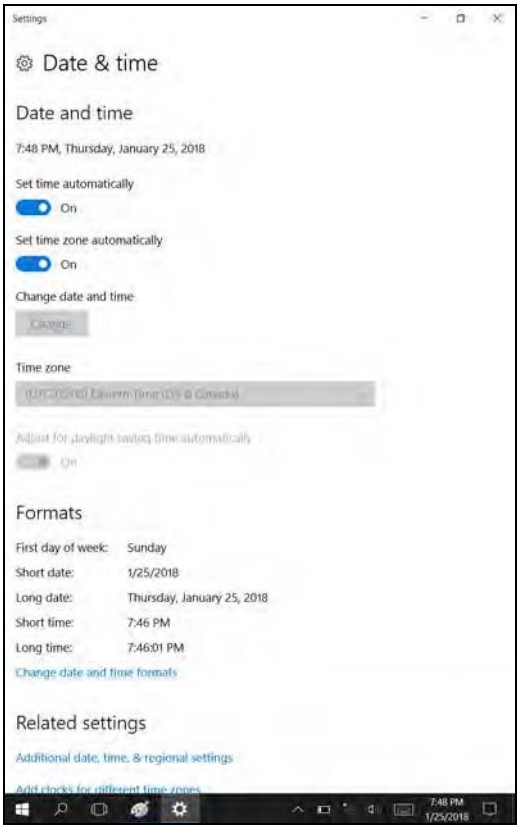
3.7.3 System Time and Date Setting

Check the tablet time and date, and configure local time and date (the time and date that will be used to identify all scans and files created), if not the same as the default.

Configure the local time and date.

1. At the bottom of the Windows Desktop screen, a tool bar appears.

2. In the corner, the date and time are displayed. To open the Windows standard system time and date utility, tap and hold the time and date display.
3. When a transparent box opens over the time and date area, lift finger away from the screen. A menu opens.
4. Tap **Adjust Date/Time**. The **Date & time** utility screen opens.



5. If it is necessary to change the tablet internal time and date settings:
   a. To enable changing dates, set the **Set time automatically** slider to the **Off** position. In the **Change date and time** option group, the **Change** button enables.
   b. Tap the **Change** button. A subscreen opens.

c. Use the controls on the subscreen to modify the date and time settings, then tap the **Change** button in the subscreen to commit the changes and close the subscreen.

6. Note: There are settings to automatically adjust times, such as: **Set time automatically** and **Adjust for daylight saving time automatically**. Consider setting these sliders to the **Off** position.
7. To close the **Date & Time** settings screen, tap the black "X" at the top corner of the screen.

3.7.4 WiFi 5.0 GHz Detection Setting

To detect 5.0 GHz WiFi signals, the tablet must be set to detect that frequency range. After 5.0 GHz detection is enabled as described in this procedure, the user can interactively choose between 2.4 GHz and 5.0 GHz using the procedure described in Section 3.6.3.3.

When switching between the ASEInspection application environment and the Windows operating system, if the Windows desktop Welcome screen opens (indicated by the large time and date display), to reach the login page, swipe upward until the login page appears.

1. Enter the Windows operating system (Section 3.7.1).
2. To open the **Panasonic PC Settings Utility** (Figure 3-15) (shortcut: press the "A" button A on the side of the tablet):
   a. At the bottom of the Windows Desktop screen, a tool bar appears.

   b. Tap the Windows Start button  . A menu appears.
   c. Flick up until the **Panasonic** folder appears. Tap the button to open the folder.
   d. Tap the **Panasonic PC Settings Utility** button (this opens the operating system version of the Dashboard, Figure 3-15).
3. Tap **Settings** >  .
4. In the **Wireless LAN: IEEE802.11a**, tap the **Enable** radio button.

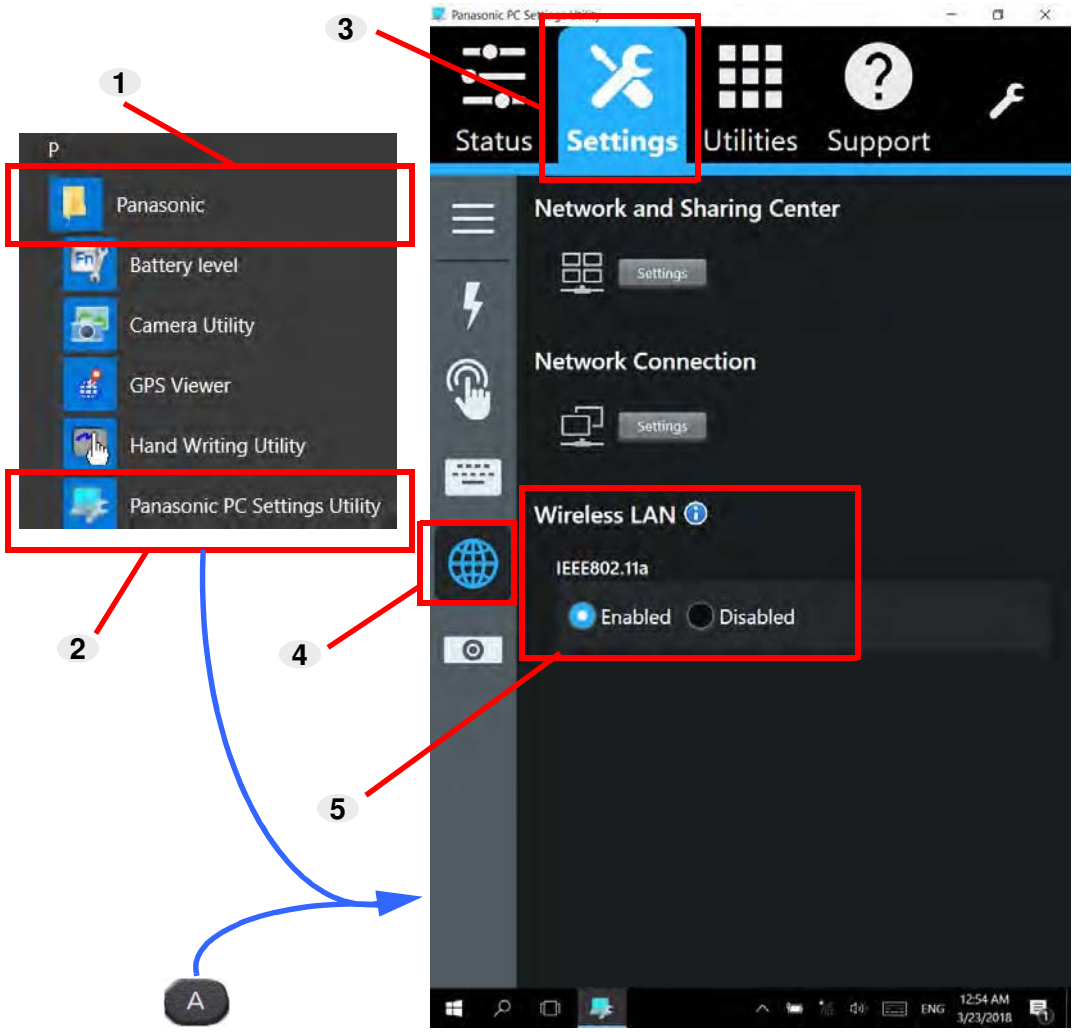


Figure 3-15: Dashboard (Panasonic PC Settings Utility) WiFi Setting. The operating system Windows Start button  is located on the tool tray at the bottom of the screen. Tap to open the applications list, tap (1) **Panasonic**, (2) **Panasonic PC Settings Utility**, (3) **Settings**, (4)  , and (5) **Enabled** for **Wireless LAN IEEE802.11a**

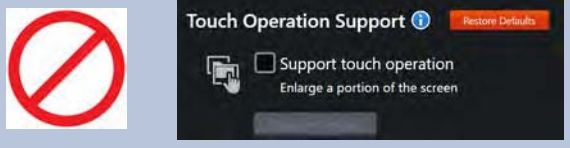
3.7.5 Touch Sensitivity Mode Setting

The sensitivity of the tablet touchscreen and Windows Start button on the touchscreen frame can be adjusted to accommodate the use of a stylus, gloves, and in wet conditions. For general use of the touchscreen, see Section 3.4.3. To adjust touchscreen sensitivity settings:

1. Enter the Windows operating system (Section 3.7.1).
2. To open the **Panasonic PC Settings Utility** (Figure 3-16) (shortcut: press the "A" button on the side of the tablet):
   a. At the bottom of the Windows Desktop screen, a tool bar appears.

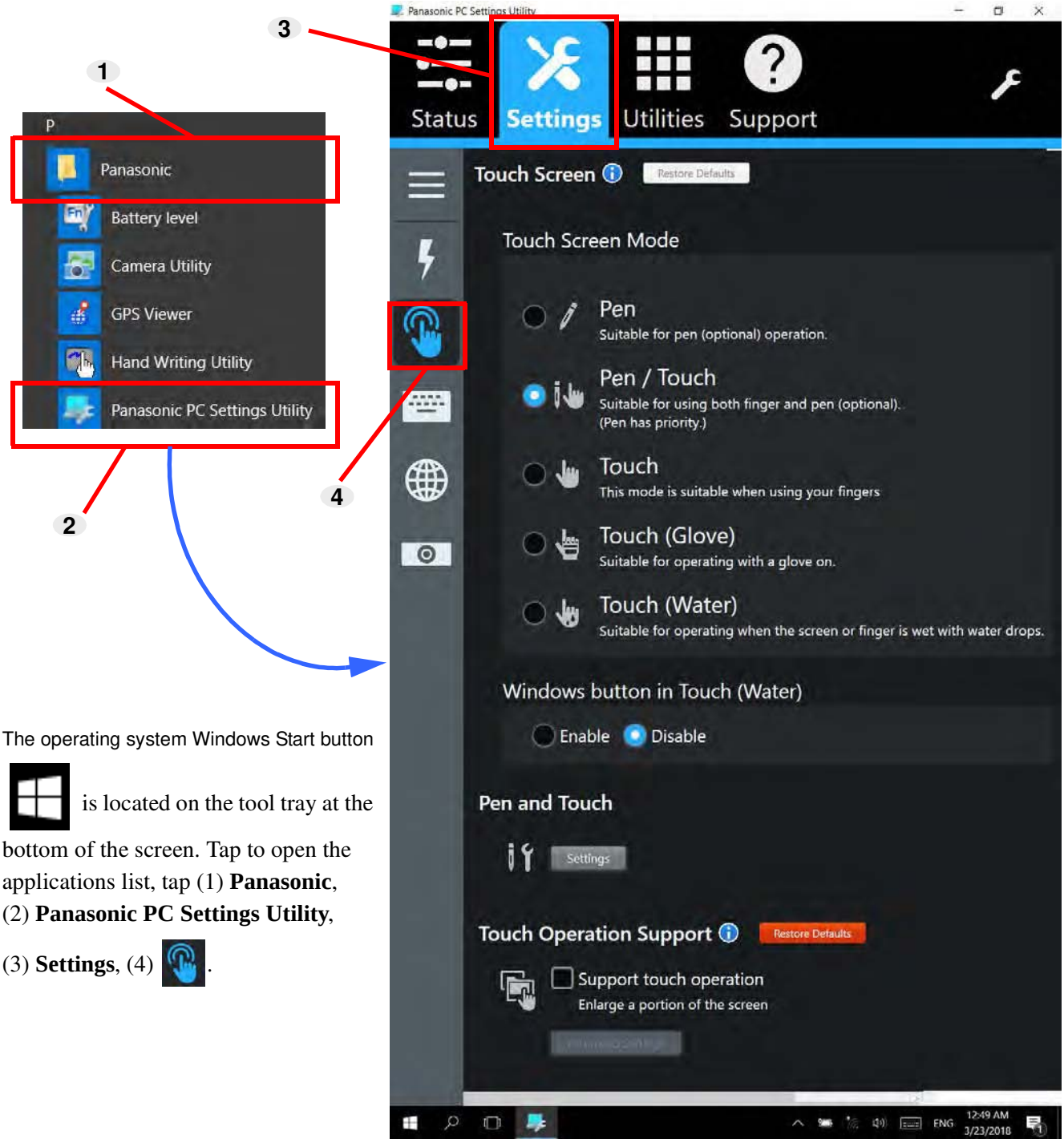
   b. Tap the Windows Start button . A menu appears.
   c. Flick up until the **Panasonic** folder appears. Tap the button to open the folder.
   d. Tap the **Panasonic PC Settings Utility** button (this opens the operating system version of the Dashboard, Figure 3-16).
3. Tap **Settings** > .

Do not use the Touch Operation Support option. This can distort the touch points in the custom applications on the tablet, making it difficult to operate.



CAUTION

Regardless of the setting here for Water mode, the tablet or the scanner must not be submerged in any liquid. When exposed to mists or spray, ensure battery connections are occupied, and the power connections are either occupied or the access panel closed tightly.



The operating system Windows Start button is located on the tool tray at the bottom of the screen. Tap to open the applications list, tap (1) **Panasonic**, (2) **Panasonic PC Settings Utility**, (3) **Settings**, (4) .

Figure 3-16: Dashboard (Panasonic PC Settings Utility) Touch Settings. For item descriptions, see Table 3-5.

Table 3-5: Touchscreen Sensitivity Controls (see Figure 3-16)

Key	Name	Function
Touch Screen Mode		
	Pen	Sensitivity to stylus only. For more on the stylus use, see Section 3.4.6.
	Pen/Touch	Sensitivity to stylus with priority, and to finger touch.
	Touch	Sensitivity to finger touch only.
	Touch (Glove)	Increased sensitivity for gloved finger touch. Use this mode when operating with a glove on. Depending on the type of glove, operation may be ignored. Gloves specifically designed for use with touch-screens are recommended. If attempt finger touch in this mode, the screen may not respond properly.
	Touch (Water)	Increased positional tolerance to account for water droplets when the screen or finger is wet with water drops. Depending on the water drop condition, operation may be ignored. • Disables the Windows Start button  on the touchscreen frame. • Restricts gestures to no more than two points of contact simultaneously. **CAUTION**: Do not use unless the option: **Windows button in Touch (Water)** mode also is enabled (in the next setting, below). Accessing the Windows operating system requires the use of the Windows Start button  on the touchscreen frame, and that access would be required to turn off this mode.
—	Windows button in Touch (Water)	Select **Enable** to allow use of the Windows Start button  on the touchscreen frame when **Touch (Water)** is selected.
	Pen and Touch: Settings	**CAUTION:** Do not use, may interfere with custom application performance. The gesture assignments made at the factory follow common industry practice, including speed, accuracy, type of gesture, and visual feedback.
	Touch Operation Support: Support touch operation	**CAUTION: Do not use**. This can distort the touch points in the custom applications on the tablet, making it difficult to operate.

3.7.6 Screen Brightness Setting

The tablet supports changing the screen brightness manually, or automatically when the ambient light changes, typically to save battery power.

1. At the bottom of the Windows Desktop screen, a tool bar appears.

2. Tap the **Action Center** button  . A menu appears.
3. Tap the **All Settings** listing. The **Settings** screen opens.
4. Tap the **System** listing. The **System** screen opens.
5. Tap the **Display** listing. The **Display** screen opens.
6. To manually adjust brightness, tap and drag the slider: **Adjust brightness level**.
7. To allow automatic adjustment, tap the switch: **Change brightness automatically when lighting changes**.
8. To commit settings, tap the **Apply** button.

The automatic feature uses readings from the light sensor located near the camera lens in the touchscreen area. The sensor must not be covered, or the sensor window dirty.

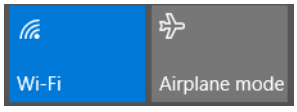
Brightness also can be set in the Dashboard operating system utility, **Status** screen (Figure 11-1).

3.7.7 WiFi Access Lock Out

To prevent the use of WiFi, perform the following steps:

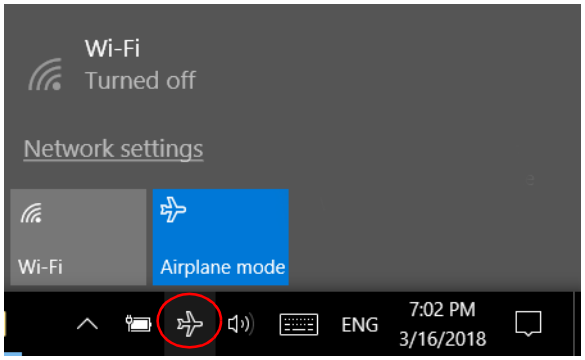
1. At the bottom of the Windows Desktop screen, a tool tray appears. If WiFi is enabled, the Networks button  appears.

2. Tap the button. A menu appears, with the **Wi-Fi** and the **Airplane mode** buttons.



3. Tap the **Airplane mode** button symbol to disable Wi-Fi.

When Airplane Mode is enabled, the airplane button  appears in the tool tray, instead of the Networks button.



To reenable Wi-Fi, return to this menu and tap the **Airplane mode** button again.

This completes the typical operating system configuration items. The MINI Z system is now ready for use. Refer to Chapter 6, Scan Procedure.

- To return to the ASEInspection applications, refer to Section 3.7.2.
- To power-off the tablet, refer to Section 3.4.1.

CAUTION

Before closing the AS&E application, make sure the initial account (SITEADMIN) password is available.

Chapter

4

System Components

This chapter introduces the primary hardware portions of the MINI Z™ system. For information on system options, see Chapter 13, Options and Accessories. The ASEInspection Software is introduced in Chapter 5, Tablet Primary Screens.

4.1 Major Exterior Components - Overview

The MINI Z systems consists essentially of a scanner and a tablet interface. These are shown in Figure 4-1. Although a tablet ships with each MINI Z system, any tablet shipped with a MINI Z system can be used with any of the MINI Z scanners of the same release level.

Figure 4-1: MINI Z scanner system major components. (1) top view, (2) left side view, (3) rear view, (4) right side view, (5) front view, (6) scanner housing, (7) mounting eyes for shoulder strap tie points, and (8) tablet.

4.2 Scanner Controls

The scanner contains the X-ray source and the power and control electronics. The scanner can be powered-on and powered-off by a key, but it cannot emit X-rays without constant communication with an active tablet. The layout of controls for the scanner is shown in Figure 4-2.

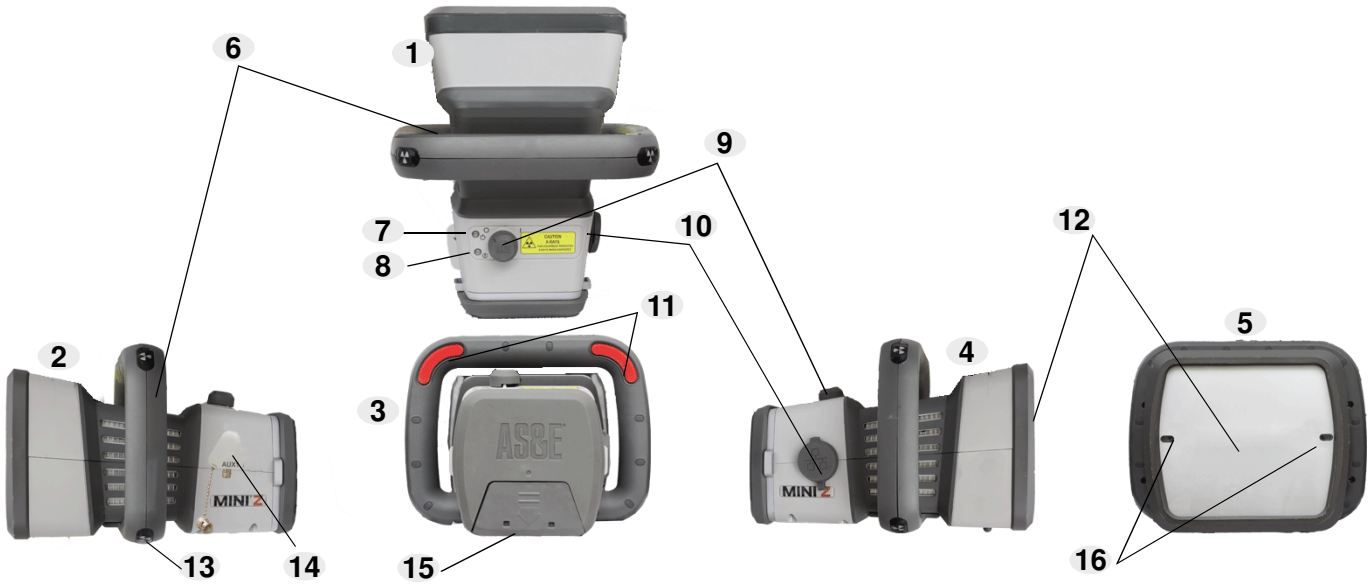


Figure 4-2: Scanner Control Keys and Terminals. The controls are described in Table 4-1. Power LED and Status LED states are described in Table 4-2.

Table 4-1: Scanner Controls

Key	Name	Function
1, 2, 3, 4, 5	Views	(1) Top view of scanner, (2) left side view, (3) rear view, (4) right side view, and (5) front view.
6	Handle	A “D” shaped handle, allowing the user to hold and maneuver the scanner from various orientations.
7	Power LED (Towards front of scanner)	Indicates the scanner power status; for descriptions see Table 4-2
8	Status LED (Towards rear of scanner)	Indicates the scanner operational status; for descriptions see Table 4-2
9	Key	Key for applying power from the integrated scanner battery to the scanner power and control circuits. The key remains captured in the lock during operation.
10	Ethernet Terminal	Connection point for Ethernet cable to tablet, when direct wired communications link is used. Not used when WiFi wireless communication link is used.

Table 4-1: Scanner Controls (continued)

Key	Name	Function
11	Trigger Button	One or both triggers must be pressed to generate emissions (after Scan Enable button has been selected in the tablet Scan screen). During emissions, the user can change grip on the handle, and not interrupt the emissions if at least one trigger button is pressed at all times, including changing which button is pressed. When both buttons are released, the emissions stop immediately. (Regardless of the state of the trigger buttons, the maximum length of time the X-ray is enabled is 30 seconds.)
12	Face	Cover on the X-ray emissions slot on the front side of the scanner.
13	“X-ray On” Indicators	Four red safety LED arrays, one on each bend of the handle, that illuminate when X-ray emissions are detected.
14	AUX1 Connector	Cable connector for future features.
15	Battery Compartment	Compartment with tethered cover housing the scanner battery that is powering the scanner (see also Figure 12-6).
16	X-ray Beam Guide LEDs	Two visible light lasers that illuminate when X-rays emissions are detected. These mark the left and right edges of the X-ray beam (marking in the vertical direction is not necessary because the X-ray beam is extremely thin). These laser beams are offset from the perpendicular by 30° (60° total fan angle, side-to-side).

Table 4-2: Scanner Status Indicator LED States

Key	Name	Function
1	Power LED (Towards front of scanner)	Indicates the scanner power status: • Off: No battery connected (or scanner off) • Flashing green: System ready, awaiting user action; Battery connected but low battery charge (less than 15%); • Steady green: Battery connected, sufficient battery charge
2	Status LED (Towards rear of scanner)	Indicates the scanner operational status: • Off: Scanner not powered-on • Flashing yellow: Seeking mode, communication with tablet not yet established (or tablet has gone into sleep mode after establishing communication), scanner X-ray elements not fully powered • Steady yellow: Communication with tablet established, scanner X-ray elements not fully powered (scanner Standby mode; use trigger buttons on handle to initiate X-ray elements) • Flashing green: Communication with tablet established, scanner X-ray elements fully powered, not ready to emit (use Scan screen to enable scans, or see Status Overview Mode Screen for messages; also appears if scanning timer expired) • Steady green: Communication with tablet established, scanner X-ray elements fully powered, ready to emit (scanner Ready mode; use trigger buttons to emit X-rays) • Steady red: Fault condition detected (emissions not enabled) (See Status Overview Mode Screen for messages)

4.3 Tablet Controls

A single tablet is provided with each MINI Z system. A tablet supplied with any MINI Z system can be used with any MINI Z scanner of the same release level. The tablet controls the emission of X-rays from the scanner, as well as storing and processing the images after they are created. The tablet can be turned off at any time without affecting the state of the scanner, except that, if a scan is taking place (X-rays emitting), the scan is stopped automatically, and any unprocessed image data is lost. The lay-out of controls for the tablet is shown in Figure 4-3.

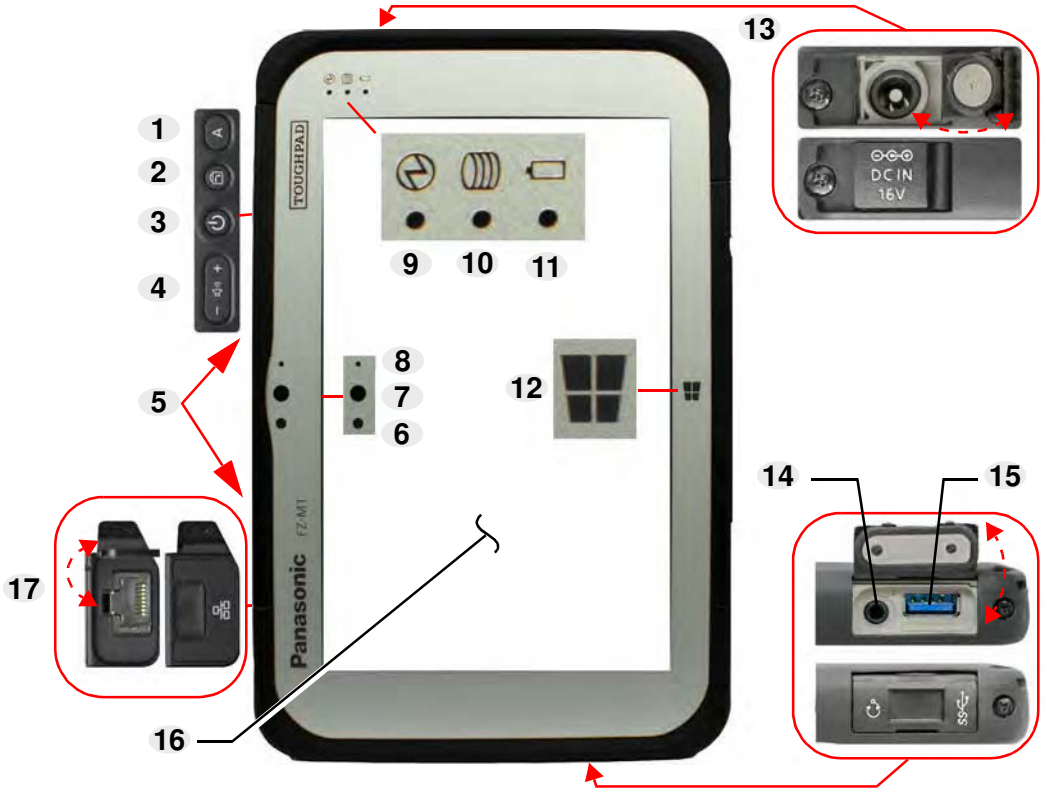


Figure 4-3: Tablet Front and Side Buttons and Terminals Locations. (1) Dashboard, (2) Screen Rotate Lock, (3) Power, (4) Volume, (5) Microphones, (6) Light Sensor, (7) Front Camera Lens, (8) Camera Status, (9) Power Status, (10) Disk Access, (11) Battery Status, (12) Windows Start, (13) DC In, (14) Headphone, (15) USB Data, (16) Touchscreen, and (17) Ethernet. (Figure repeated in Table A-6. For item descriptions, see Table 4-3.)

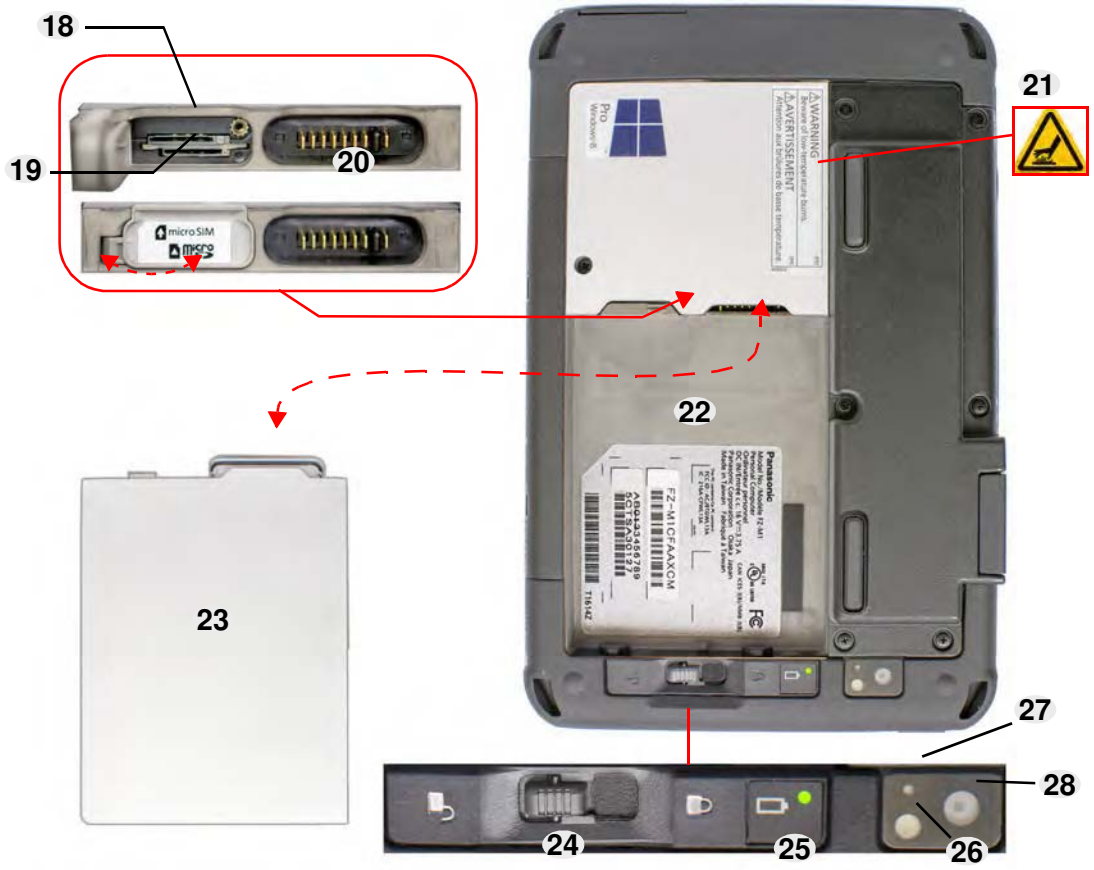


Figure 4-4: Tablet Rear Buttons and Terminals Locations. (18) microSIM, (19 microSD, (20 Main Battery socket, (21) Tablet manufacturer warning against prolonged contact, (22) Tablet manufacturer model and serial number, (23) Main Battery Pack, (24) Main Battery Lock (unlocked position), (25) Battery Hot Swap Status, (26) Rear Camera Light, (27) Rear Camera Status, and (28) Rear Camera Lens. (Figure repeated in Table A-7. For item descriptions, see Table 4-3.)

Table 4-3: Tablet Controls

Key	Name	Function
Front-1	Dashboard (button) 	Button is operable for direct access to the Dashboard (Panasonic PC Settings) when the user is operating in the Windows operating system. Not enabled for use when the user is operating in the ASEInspection application. Alternatively, dashboard functions are available to supervisor user accounts through the Windows operating system menus. Press to open Dashboard (may take a few seconds), press again to close. See Section 11.2.
Front-2	Screen Rotation Lock (button) 	Enables/disables rotation of screen to match the orientation of the tablet relative to the ground, such as for automatically switching between portrait and landscape display modes. Disabling locks the screen in the orientation when the button is pressed, until the button is pressed again. For procedure, Section 3.7.7.
Front-3	Power (button) 	Press for less than 2 seconds to power on/power off the system or to enter/exit Sleep mode. For procedure, Section 3.6. Also used in combination with other keys to set various parameters in the tablet, such as Windows operating system access.
Front-4	Volume (rocker switch) 	Sets playback volume for headphones. Also used in combination with other keys to set various parameters in the tablet, such as Narrator.
Front-5	Microphone (apertures)	Two holes with microphone inset. Monaural signal.
Front-6	Light Sensor (window)	Used for sensing ambient light for automatic adjustment of screen brightness. For procedure, see Section 3.7.6.
Front-7	Camera Lens (Front) (window)	Used for taking photographs of objects facing the touchscreen.
Front-8	Camera Status (Front) (LED)	LED illuminates yellow to warn that the camera facing the touchscreen is active.
Front-9	Power Status (LED) 	LED illuminates steady green to indicate the tablet is powered; blinks green once every 2 seconds to indicate Sleep mode is active.
Front-10	Disk Access (LED) 	LED illuminates green to indicate the tablet solid state drive is being accessed.
Front-11	Battery Charge Status (LED) 	Color and state indicate charge status. For a listing of states, see Section 12.4.5. ASEInspection provides the specific charge level; see Section 12.4.6
Front-12	Windows Start (button) 	Press to enter Sleep mode. Supervisor user accounts can use for accessing operating system. For procedure, Section 3.7.1. This button is disabled by default when the touchscreen sensitivity is set to **Touch (Water)**. See Section 3.7.5.

Table 4-3: Tablet Controls (continued)

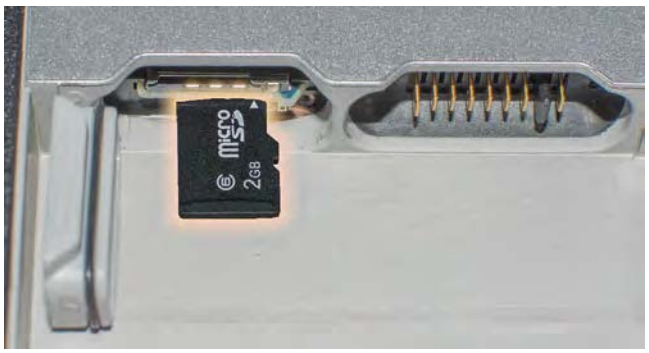
Key	Name	Function
Front-13	DC IN (socket)	Open the door to access the connector socket for the AC adapter external power supply/battery charger. Should be closed when changing the main battery or an SD or SIM card. The symbol on the door is the polarity of the plug that must be used to supply power.
Front-14	Headphone socket	Open the door to access. Accepts a standard 3.5mm (1/8 in.) earplug/headphone connector for stereo monitoring.
Front-15	USB Data socket	Open the door to access. Accepts USB 3.0 and earlier male A type data storage device. The ASE software uploads and downloads inspection records and images using this port. Leaving a device in the USB port may interfere with device shutdown and with resuming from Sleep mode.
Front-16	Touchscreen	Primary interface to the tablet for ASEInspection software.
Front-17	Ethernet socket	Open the door to access. RJ-45 connector for Ethernet communication cable between the tablet and the scanner unit. Used when site policy does not allow the use of WiFi for communications. For procedure, Section 3.7.1.
Rear-18	microSIM socket	Disconnect the AC power adapter, and unlock and remove the main battery to open the door to load or unload a microSIM data card, which may be used for system upgrades. Card can be used when door is closed and main battery is reinserted or AC power is connected.
Rear-19	microSD socket	Disconnect the AC power adapter, and unlock and remove the main battery to open the door to load or unload a microSD data card, which may be used for Export, Backup, and Restore functions. Card can be used when door is closed and main battery is reinserted or AC power is connected. The microSD memory card slot on this computer accepts microSD, microSDHC, and microSDXC memory cards. 
Rear-20	Main battery socket	Accepts main battery pack data an power plug.
Rear-21	Tablet Manufacturer Heat Warning (label)	Warning against prolonged exposed skin contact with warm surface of circuit box; can possibly cause low-temperature burns.
Rear-22	Tablet Manufacturer Model and Serial Numbers (label)	Tablet manufacturer model number. Reference the AS&E model number when inquiring for service.
Rear-23	Main Battery Pack	Typical battery pack. Use only approved batteries.

Table 4-3: Tablet Controls (continued)

Key	Name	Function
Rear-24	Main Battery Pack Lock (switch)	Latches the main battery pack in place. Ensure it is closed fully to prevent the battery pack from falling from the tablet. See Section 12.4.3
Rear-25	Battery Hot Swap Status (LED) 	Indicates if the main battery pack can be hot-swapped. For a list of states, see Section 12.4.9.
Rear-26	Camera Light (Rear) (window)	Strong LED light source for flash picture taking. Do not look directly into the beam from a close distance.
Rear-27	Camera Status (Rear) (LED)	LED illuminates yellow to warn that the camera facing the touch-screen is active.
Rear-28	Camera Lens (Rear) (window)	Used for taking photographs of objects facing the rear of the camera.

4.4 Memory Card Slots

The tablet has a slot for microSIM cards and a slot for microSD cards. The microSD memory card slot on this computer accepts microSD, microSDHC, and microSDXC memory cards.

AS&E is not responsible for the performance of data cards, or any loss of data from use of data cards or hot-swapping the main battery pack.

The cards are automatically read by the tablet in the **Export**, **Restore**, and **Backup** screens for data transfer functions, as shown in Figure 4-5.

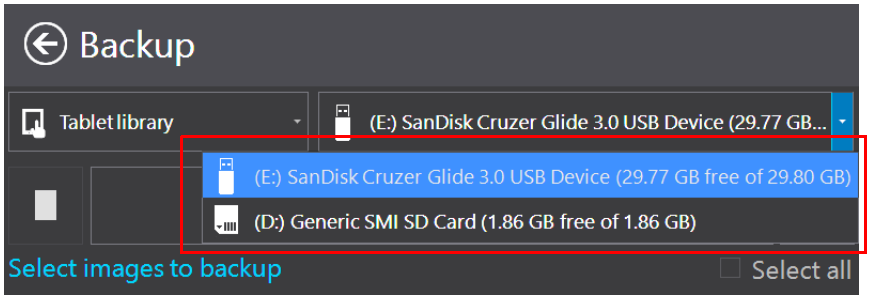


Figure 4-5: Automatic Memory Card Access. Example shows a Backup screen, with two alternative data store destinations available. (Top: blue highlight) a USB device at the external USB port, and (Bottom) a microSD card in the internal port inside the Main Battery bay.

When loading or unloading a card, an embedded Lithium-polymer “bridge” battery provides power while the main battery is removed and replaced (referred to as hot swapping) to allow access to the memory card bay. Ensure that the bridge battery has sufficient power, indicated by the bridge battery status indicator light illuminating green when the main battery is first loosened. If the light does not show green, relatch the main battery without removing it (to avoid possible data loss in the tablet memory) and power-off the tablet before removing the main battery.

In general, it is good practice to save all data before attempting a hot-swap.

- While the battery is being removed to allow access to the data storage card bay turn off the tablet, remove the main battery pack, and open the door to the memory card slot bay (Figure 4-4). After inserting or removing the card, close the bay door, insert the main battery pack again, and lock the battery pack in place. The cards may have to be formatted to adapt to the application software.

WARNING

The scanner unit has a SIM card, accessible in the battery bay (Figure 12-7). This card contains configuration data for the unique scanner unit. Never remove or exchange that SIM card, except with direct instructions from AS&E, such as for firmware updates.

4.4.1 Accessing Memory Cards

The tablet has a slot for microSIM cards and a slot for microSD cards. Access is through the Main Battery bay.

1. Disconnect the AC power adapter.
2. Squeeze the main battery latch to the left, until the battery pops up. (If hot swapping, the indicator LED must be green. See Section 12.4.5.)
3. Gently pull the battery pack to unplug it, and the remove it from the bay.
4. Swing open the card bay door from the center of the tablet side.
5. Insert the card until it clicks, or remove an installed card by pressing in gently until the card springs out.
6. Close the memory card bay door.
7. Insert and connect the Main Battery.
8. Press both corners on the loose end of the Main Battery, pushing it down into the bay until the latch snaps over to the right and locks.

Chapter

5 Tablet Primary Screens

This chapter provides an overview of the tablet user interface. The software application, ASEInspection, is loaded on a touchscreen tablet, provided as part of the MINI Z system. A map of the system software screens is available at Table 5-5. Some features do not appear for operator-level login accounts.

The appearance of the software screens can vary according to the orientation of the tablet, if automatic rotation is enabled. This allows the screen to rotate to maintain an upright appearance relative to gravity, regardless of the orientation of the tablet itself (Section 3.4.4).

5.1 Home Screen

The Home screen is displayed at startup. The layout is shown in Table 5-1.

Figure 5-1: Home Screen Layout. Top-level screen of the MINI Z software. Tap individual buttons in the Content pane to open screens for controlling system functions. The buttons are described in Table 5-1.

Table 5-1: Home Screen Description (refer to Figure 5-1)

Key	Name	Function
	Navigation Bar (top of screen)	
1	Change Password button 	Change password for current login account (see Section 10.4)
2	Logout button 	Log out of the ASEInspection Software (opens login screen for next user: see Section 10.2)
3	Exit button 	Close the ASEInspection Software and power off the tablet.
	Content Pane (middle of screen)	
4	Scan screen button 	Scan and group images, view, annotate, enhance, and export images (Scan Monitor Mode Screen) view current group (Scan Gallery Mode Screen)
5	Review screen button 	Search (Review and Delete Search Mode Screen), view, annotate, enhance, and export individual screen capture images (Review View Mode Screen)
6	Export screen button 	Export sets of image files selected from the tablet solid state hard drive (Export Screen)
7	Restore screen button 	Copy images from external storage device (Restore Screen)
8	Backup screen button 	Copy or move images to external storage device (Backup Screen)
9	Settings screens button 	Set screen appearance (light or dark background), change screen language (supervisor accounts), incident reports (Settings General Mode Screen), add and edit user accounts (Settings Users Mode Screen) and user account policies (Settings Policies Mode Screen)
10	Help applications button 	View Operator Manual and Operator Manual
	Status Bar (bottom of screen) see Section 3.5	
11	WiFi Connection button 	Access for WiFi connections (Section 3.6.3.1). When Ethernet cable is connected, appears as  (Section 3.3.1)
12	Scanner Connection icon 	Indicates if the tablet is (left example) connected to a scanner unit or (right example) not connected to any scanner unit.
13	AS&E Software version display	Displays the revision level of the ASEInspection™ Software
14	Status screen button 	View Status Overview Mode Screen (Displays general status, faults, and warnings) and Status Details Mode Screen (Displays performance parameters in real time, and for supervisor accounts: WiFi region setting and scanner calibration)

5.2 Scan Monitor Mode Screen

The Monitor mode of the **Scan** screen is used to enable and monitor scanning as it is occurring. The screen layout is shown in Figure 5-2. It allows the user to perform scans, to comment, enhance, and export copies of images, and to create and annotate image groups. (For more information, see Section 7.4, Operational Considerations.).

Figure 5-2: Scan Monitor Mode Screen Layout. The buttons are described in Table 5-2. Scanning operation is described in Section 7.4, Operational Considerations.

The Scan Enable button (Scan screen top) and the Enabled Status icon (Scan screen bottom) appear similar. The Scan Enable button (screen top) signals the scanner to allow emissions, and the Enabled Status icon (screen bottom) indicates the scanner status.

The following modes are indicated by the appearance of the button and the icon:
1. No scanner connected. (Connect scanner to continue.)
2a or 2b. Scanner connected, but not enabled. (Tap Scan Enable button at top of Scan screen to enable.)
3. Scanner connected and enabled. (Press trigger button on scanner to scan for 30 seconds.)

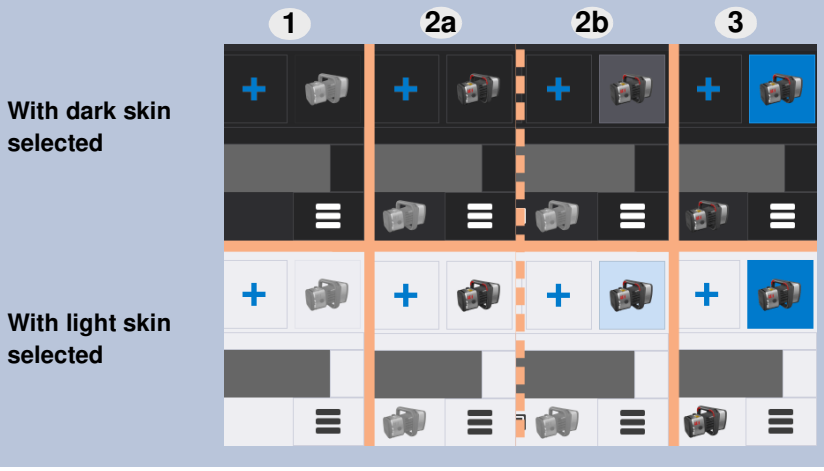


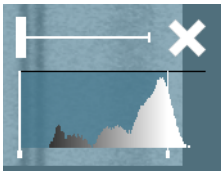
Table 5-2: Scan Monitor Mode Screen Description (refer to Figure 5-2)

Key	Name	Description
	Navigation Bar (top of screen)	
1	Back button	Tap once to return to the Home screen.
	Content Pane (middle of screen)	
2	Mode button	With this marking, indicates Monitor mode is active. Tap to switch to Gallery mode of the Scan screen. This button is inactive until at least one scan has been taken in the current image group (Gallery mode cannot be accessed until then).
3	Current Scan Group Name and image sequence display and Comment box	Displays the group into which all new scans will be placed. If no group has yet been created, displays default group name, *Images*. Not available for Multiple Images groups.
4	Add (“+”) button	Tap to create a new scan image group. Opens the Group Name text entry box (tap inside the box to enable the on-screen keyboard, type the name for the new group, then tap the **OK** button to save the name and close the box; the group name appears in the Current Scan Group Name field).

Table 5-2: Scan Monitor Mode Screen Description (refer to Figure 5-2) (continued)

Key	Name	Description
5	Scan Enable button 	Tap to enable the scanner trigger buttons for 30 seconds of time. Note: This button serves as the first of a two-part interlock. After this button is tapped and the button background changes to dark blue  , the operator must then press and hold a trigger button on the scanner handle before the 35-second time-out period expires, or this button must be tapped again. After each scan, the Scan Enable Timer is reset automatically, so it is not necessary to return to the tablet and re-tap this button for each scan, when started within 35 seconds of the previous scan. Note: While a scan is being performed (and this button would be tapped On: symbol in full color with dark blue background), tapping this button again immediately disables the scanner emissions (the button background color highlight is removed). This is a safety interlock feature to allow the tablet user in 2-person operation mode to disable the scanner if there is a dangerous situation imminent.
6	Image Enhancement menu button	Tap to open or close the Enhancements Tool menu (commands for image enhancement for analysis). See Section 8.1, Viewing and Enhancing Images).
7	Previous Image button	If bolded, indicates that there exists one or more previous scans. Tap to display the previous scan. • If a standard scan group is currently being displayed, indicates there exists one or more previous scans in the current standard image group. • If a Multiple Images scan group is currently being displayed, skips any standard scans and goes to the previous Multiple Image Scan group.
8	Flag button 	Tap to flag the image for ease of selection in searches and protection in deletions. When button is red, the image is flagged (see Section 7.5.4, Flags for Scan Images and Section 9.4.3, Search Criteria Subscreen).
9	Image area	Displays scanned images as they are being acquired and individual scans taken in the current group. The message “Image not Present” displayed in the Image area is a placeholder reserved for the next image scanned. Blue border indicates the selected image. In Multiple Image groups, only the individual selected scan has the blue border.
10	Next Image button	If bolded, indicates that there exists one or more subsequent scans. Tap to display the next scan. • If a standard scan group is currently being displayed, indicates there exists one or more subsequent scans in the current standard image group. • If a Multiple Images scan group is currently being displayed, skips any standard scans and goes to the next Multiple Images Scan group.

Table 5-2: Scan Monitor Mode Screen Description (refer to Figure 5-2) (continued)

Key	Name	Description
11	Histogram 	Click to open an interactive histogram to optimize image characteristics.See Section 8.1.5, Histograms 
12	Source Technology 	Indicates the X-ray technology used to create the image. “Bx” indicates Backscatter technology.
	Status Bar (bottom of screen) see Section 3.5 for full description	
13	X-ray Emission Status 	When visible, indicates that X-rays are being emitted.
14	Scan Enable Status  	Visible when scanner is interconnected to tablet. (Left example) Full color version indicates that the scanner has been enabled to emit X-rays (Scan Enable button on this screen has been set). (Right example) Gray version indicates that the scanner has not been enabled to emit X-rays (scanner is connected, but the Scan Enable button on this screen has not been set or the Scan Enable button had been set, but the Scan Enable Timer has expired).

5.3 Scan Gallery Mode Screen

The Gallery mode of the **Scan** screen is used to view thumbnails of all of the images in the image groups created during the current calendar day. This screen is available only after at least one scan has been made in the current image group. The screen layout is shown in Figure 5-2. (For more information see Section 7.4, Operational Considerations.)

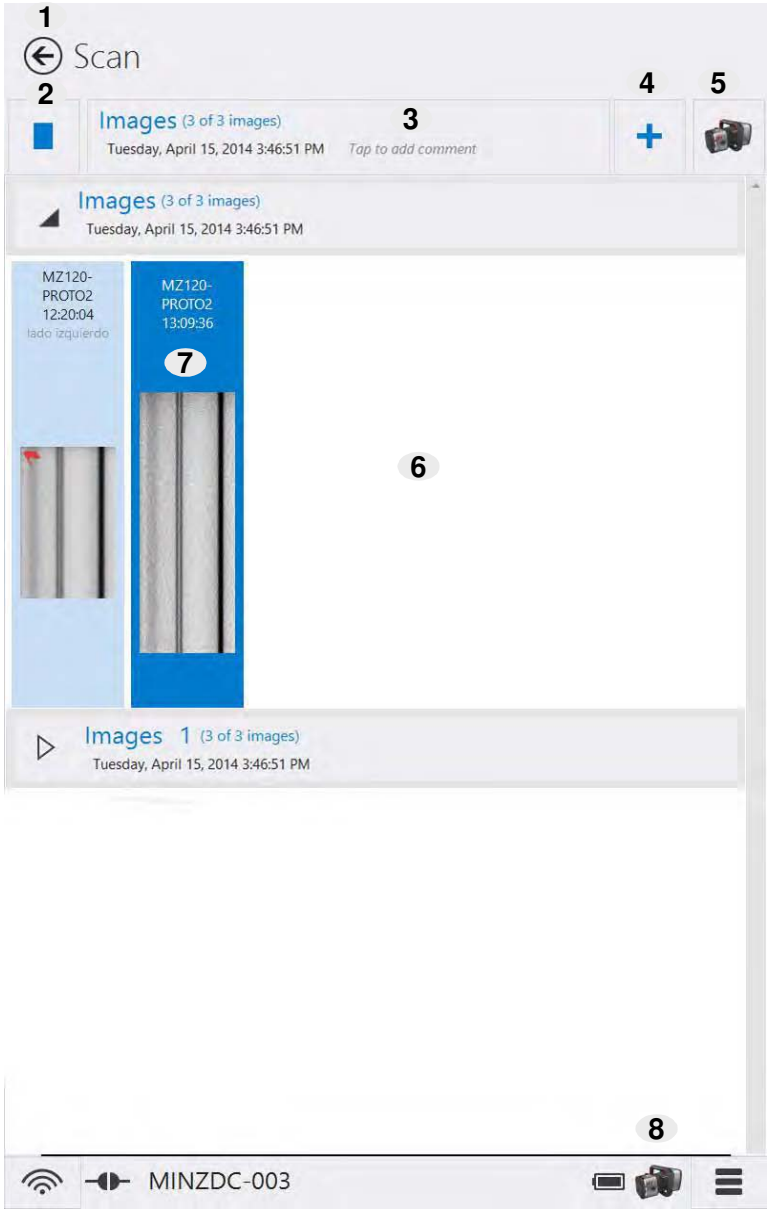


Figure 5-3: Scan Gallery Mode Screen Layout. The buttons are described in Table 5-3. Scanning operation is described in Section 7.4, Operational Considerations.

Table 5-3: Scan Gallery Mode Screen Description (refer to Figure 5-3)

Key	Name	Description
	Navigation Bar (top of screen)	
1	Back button 	Tap once to return to the Home screen.
	Content Pane (middle of screen)	
2	Mode button 	With this marking, indicates Gallery mode is active. Tap to switch to Scan Monitor Mode Screen.
3	Current Scan Group Name and image sequence display and Comment box	Displays the group into which all new scans will be placed. If no group has yet been created, displays default group name, *Images*. Not available for Multiple Images groups.
4	Add (“+”) button	Tap to create a new scan image group. Opens the Current Group Name text entry box (tap inside the box to enable the on-screen keyboard, type the name for the new group, then tap the OK button to save the name and close the box; the group name appears in the Current Scan Group Name field). When the next scan is taken, the Scan Monitor Mode Screen opens automatically.
5	Scan Enable button	Tap to enable the scanner trigger switch buttons for 30 seconds of time. Highlighted dark blue background indicates that the Scan Enable timer has been set (scanning enabled). When the next scan is taken, the Scan Monitor Mode Screen opens automatically.
6	Gallery pane, Image thumbnails	Displays all image thumbnails in the currently active group. Double-tap an image thumbnail to select it for display in the Scan Monitor Mode Screen. No scan display after reset (see Section 9.1, Daily Gallery Refresh). Each thumbnail is identified by the serial number of the scanner that generated the image, the image creation time and user comments. The red flag indicates the image is flagged for searches.
7	Highlighted image	Indicates the image currently selected for viewing in the Scan Monitor Mode Screen mode. Tap to change mode.
	Status Bar (bottom of screen) see Section 3.5 for full description	
8	Scan Enable Status  	Visible when scanner is interconnected to tablet. (Left example) Full color version indicates that the scanner has been enabled to emit X-rays (Scan Enable button on this screen has been set). (Right example) Gray version indicates that the scanner has not been enabled to emit X-rays (scanner is connected but Scan Enable button on this screen has not been set or Scan Enable button had been set, but the Scan Enable Timer has expired).

5.4 Review View Mode Screen

The View mode of the Review screen, shown in Figure 5-4, allows the user to view and enhance Reference images and images from previous scanning sessions. The image must first be selected in the

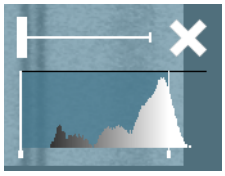
Search mode of the Review screen, shown in Figure 5-5. In the Search mode, double-tap the image of interest to show it in the View mode.

Figure 5-4: Review View Mode Screen Layout. The buttons are described in Table 5-4.

Table 5-4: Review View Mode Screen Description (refer to Figure 5-4)

Key	Name	Description
	Navigation Bar (top of screen)	
1	Back button 	Tap once to return to the Home screen
	Content Pane (middle of screen)	
2	Mode button 	With this marking, indicates View mode is active. Tap to switch to Search mode of the Review screen, where image groups are viewable in gallery format.
3	Current Scan Group Name and image sequence display	Displays the name of the image group being shown, and the sequence number and creation date and time of the currently displayed image within that group. Double-tap to open the on-screen keyboard to enter information about the currently displayed scanned image. Information appears also in the Review Search mode screens.
4	Image Identification Data	• Image Number – Consecutive number assigned by each tablet to images recorded from scanners • Scanner Serial Number – Serial number of the scanner that generated the image • User Name – User name of the login account that generated the image
5	Image Enhancement Tools menu	Tap to open or close the Enhancements Tool menu (tools for image enhancement for analysis) For more information, see Section 8.1.2, Enhancements Toolbar (also available in Scan Monitor Mode Screen).
6	Previous Image button	If bolded, indicates that there exists one or more previous scans. Tap to display the previous scan. • If a standard scan group is currently being displayed, indicates there exists one or more previous scans in the current standard image group. • If a Multiple Images scan group is currently being displayed, skips any standard scans and goes to the previous Multiple Image Scan group.
7	Image area	Displays scanned images at full resolution
8	Next Image button	If bolded, indicates that there exists one or more subsequent scans. Tap to display the next scan. • If a standard scan group is currently being displayed, indicates there exists one or more subsequent scans in the current standard image group. • If a Multiple Images scan group is currently being displayed, skips any standard scans and goes to the next Multiple Images Scan group.

Table 5-4: Review View Mode Screen Description (refer to Figure 5-4) (continued)

Key	Name	Description
9	Histogram 	Click to open an interactive histogram to optimize image characteristics.See Section 8.1.5, Histograms 
10	Source Technology 	Indicates the X-ray technology used to create the image. “Bx” indicates Backscatter technology.
	Status Bar (bottom of screen) see Section 3.5 for full description	

5.5 Review and Delete Search Mode Screen

The Review Search mode and image delete screen layout is shown in Figure 5-5. It allows the user to use search criteria to find images. The images or groups that match the search criteria are displayed in galleries. Groups of images can be deleted or individual images can be selected for viewing.

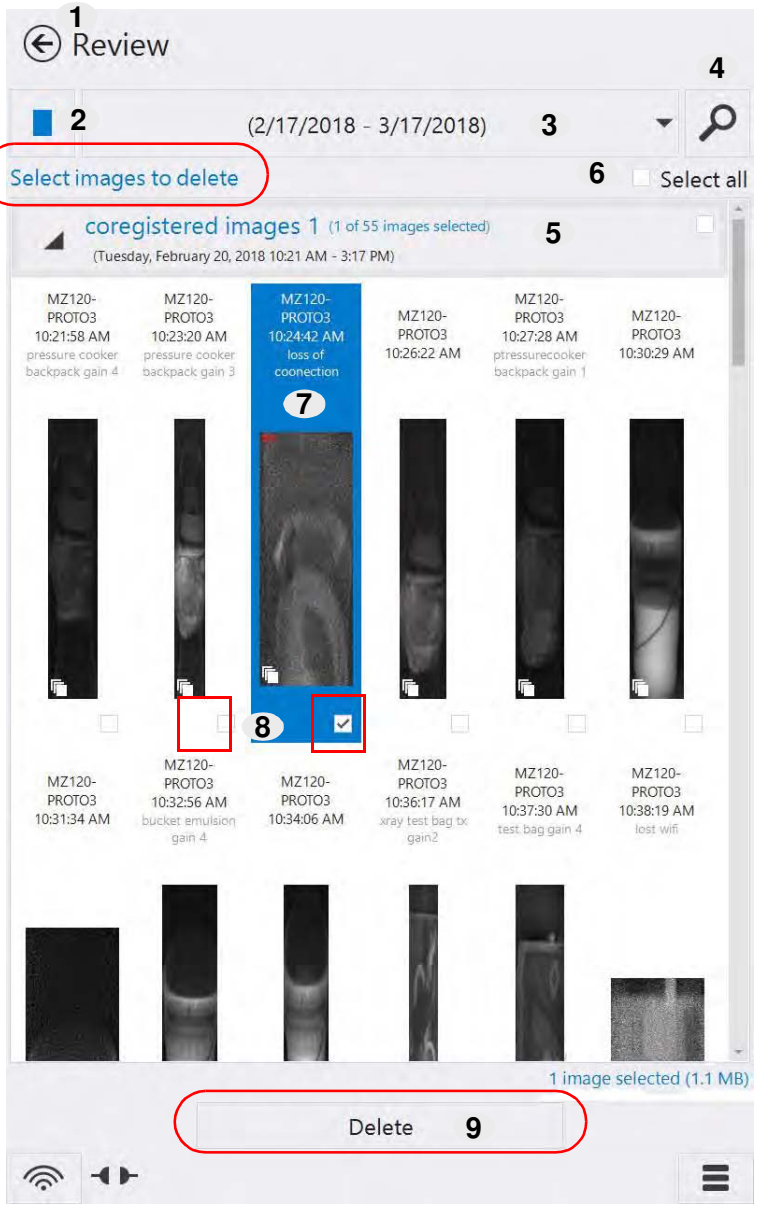


Figure 5-5: Review Search Mode and Image Delete Screen Layout. The buttons are described in Table 5-5.

Selecting individual images or image groups, or the **Select All** button, and then tapping the **Delete** button permanently deletes the selected images and groups from the tablet. When images are selected to deletion, the adjacent check box has a mark in it. 

To simply view previously saved images in full scale, do not select the image check boxes, simply double-tap the image thumbnail itself. The check box should remain clear  . The Review View mode screen opens.

For more information on searching, see Section 9.4, Searching for Images. In the returned images, the user can double-tap the particular image of interest to display it in the Review View mode screen (Figure 5-4), where it can be seen at full resolution and enhanced to aid in distinguishing details.

In addition, the user can tap the **Delete** button at the bottom of the screen to delete the selected images from the onboard database (see Section 9.11, Deleting Images). Images that have been flagged are not automatically deleted; the user must acknowledge those before deletion.

Table 5-5: Review Search Mode Screen Description (refer to Figure 5-5)

Key	Name	Description
	Navigation Bar (top of screen)	
1	Back button 	Tap once to return to the Home screen.
	Content Pane (middle of screen)	
2	Mode button 	With this marking, indicates Search mode is active. Tap to switch to View mode of the Review screen.
3	Selection Criteria	Displays the criteria used to select the displayed images or groups. “All Images” indicates that no criteria were set. Note: Until the Search button is tapped, this data relates to the previous search. Tap to display the Search criteria, used to enter filtering criteria for finding images and groups. For more information, see Section 9.4.3, Search Criteria Subscreen.
4	Search button 	After entering search criteria, tap to execute search for images.The contents of the galleries are updated to match the search criteria. If the search is performing a multi-variable query on a very large quantity of inspection records, there may be a delay. In that case, in the gallery area of the screen the following spinner box message appears: 

Table 5-5: Review Search Mode Screen Description (refer to Figure 5-5) (continued)

Key	Name	Description
5	Image group headers	For each group matching the search, or images that matched the search, displays the group name of the groups, quantity of images and quantity selected from each group, and creation date and time range of the images. Tap to expand headers individually and show thumbnails of the images in the group in the gallery. Tap the check box in the header to select all or deselect all of the images displayed in the gallery under the header. The Multiple Images group icon does not appear in this screen.
6	**Select All** check box	Tap to select all images and groups that matched the search criteria.
7	Highlighted image	Indicates the image currently selected for viewing in the Review View Mode Screen mode.
8	Selected Check Box	Tap to select the individual image has been selected for deletion. Note: The check box may appear to be outside of the image itself. To locate it more easily, tap the image to select it, providing a blue background.
9	Gallery pane, Image thumbnails	Displays groups of image thumbnails in an expandable list format. Double-tap an image thumbnail to select that image for individual viewing in the View mode screen. Tap to select the individual image has been selected for deletion. Note: The check box may appear to be outside of the image itself. To locate it more easily, tap the image to select it, providing a blue background. Each thumbnail is identified by the serial number of the scanner that generated the image, the image creation time and user comments. The red flag indicates the image is flagged for searches.
10	**Delete** button	Deletes images that are selected in this screen. They are removed from the onboard database. Images that are flagged are not automatically deleted. The user must acknowledge the deletion. See Section 9.11, Deleting Images.
	Status Bar (bottom of screen) see Section 3.5 for full description	

5.6 Export Screen

The Export screen layout is shown in Figure 5-6. It allows the user to use search criteria to find previously scanned images, and to copy them to external data storage. See Section 9.6, Exporting Images.

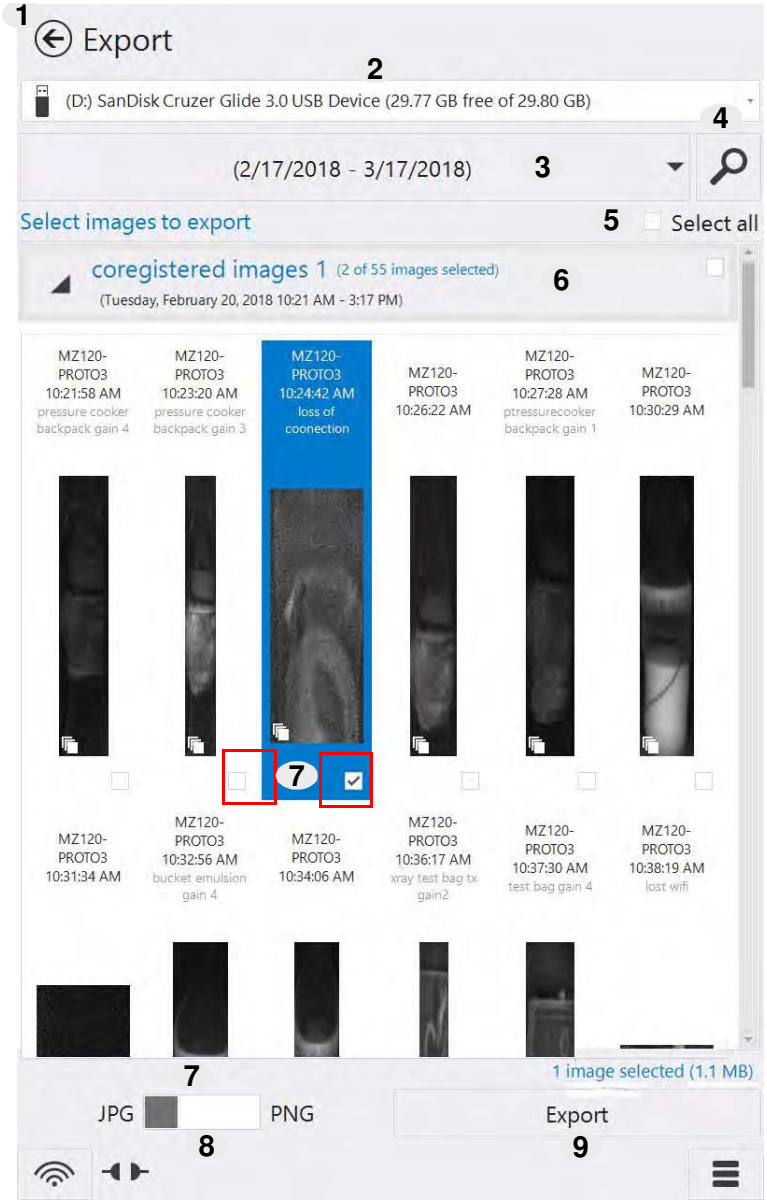


Figure 5-6: Export Screen Layout. The buttons are described in Table 5-6.

Table 5-6: Export Screen Description (refer to Figure 5-6)

Key	Name	Description
	Navigation Bar (top of screen)	
1	Back button 	Tap once to return to the Home screen
	Content Pane (middle of screen)	
2	Destination Storage Device	Tap to open a menu of available external storage devices
3	Selection Criteria	Displays the criteria used to select the images to delete in the previous search. “All Images” indicates that no criteria were set. Tap to display Search criteria, used to enter filtering criteria for finding images. For more information, see Section 9.4.3, Search Criteria Subscreen.
4	Search button 	After entering search criteria, tap to execute search for images.The contents of the galleries are updated to match the search criteria. If the search is performing a multi-variable query on a very large quantity of inspection records, there may be a delay. In that case, in the gallery area of the screen the following spinner box message appears: 
5	Select All	Tap to select all images and groups that matched the search criteria.
6	Image group headers	For each group matching the search, displays the name, quantity of images and quantity selected from each group, and creation date and time range of the images. Tap to show thumbnails of the images in that group. Tap the check box in the header to select all or deselect all of the images in the image group.
	Gallery pane, Image thumbnails	Displays groups of image thumbnails in an expandable list format. Tap the check box at the top corner of an image thumbnail to select that image. Each thumbnail is identified by the serial number of the scanner that generated the image, the image creation time and user comments. The red flag indicates the image is marked for ease of selection or protection from deletions (flagged images will not be deleted without confirmation from the user.)
7	Selected Check Box	Tap to select the individual image for export. Note: The check box may appear to be outside of the image itself. To locate it more easily, tap the image to select it, providing a blue background.
8	Export File Format	Tap to set the industry-standard file format for the exported files.

Table 5-6: Export Screen Description (refer to Figure 5-6) (continued)

Key	Name	Description
9	Export	Tap to perform the export.
	Status Bar (bottom of screen) see Section 3.5 for full description	

5.7 Restore Screen

The Restore screen layout is shown in Figure 5-7. It allows the user to load images previously backed-up onto an external storage device. For more information on restoring images, see Section 9.10, Restoring Images.

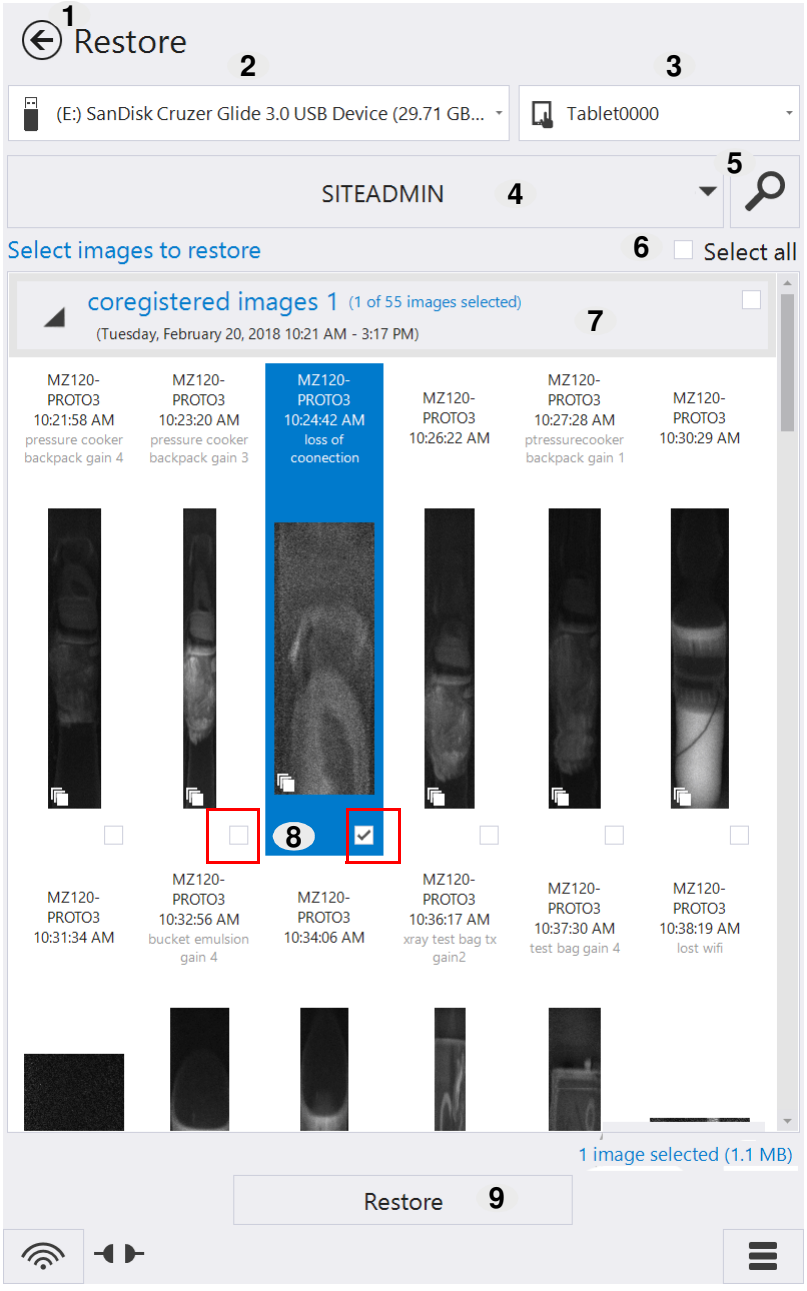


Figure 5-7: Restore Screen Layout. The buttons are described in Table 5-7.

Table 5-7: Restore Screen Description (refer to Figure 5-7)

Key	Name	Description
	Navigation Bar (top of screen)	
1	Back button 	Tap once to return to the Home screen
	Content Pane (middle of screen)	
2	Source Storage Device	Tap to open a menu of available external storage devices
3	Library	Tap to open a menu of image source libraries: • For images backed up as normal images, choose the ID of the tablet that originally recorded the images • For images previously backed up as Reference images, choose **Reference Library**.
4	Selection Criteria	Displays the criteria used to select the images to restore in the previous search. “All Images” indicates that no criteria were set. Tap to display Search criteria, used to enter filtering criteria for finding images. For more information, see Section 9.4.3, Search Criteria Subscreen.
5	Search button 	After entering search criteria, tap to execute search for images.The contents of the galleries are updated to match the search criteria. If the search is performing a multi-variable query on a very large quantity of inspection records, there may be a delay. In that case, in the gallery area of the screen the following spinner box message appears: 
6	Select All	Tap to select all images and groups that matched the search criteria.
7	Image group headers	For each group matching the search, displays the group name of the groups, quantity of images and quantity selected from each group, and creation date and time range of the images. Tap to show thumbnails of the images in that group. Tap the check box in the header to select all or deselect all of the images in the image group.
	Gallery pane, Image thumbnails	Displays groups of image thumbnails in an expandable list format. Tap the check box at the bottom corner of an image thumbnail to select or deselect that image. Note: The check box may appear to be outside of the image itself. To locate it more easily, tap the image to select it, providing a blue background. Each thumbnail is identified by the serial number of the scanner that generated the image, the image creation time and user comments.

Table 5-7: Restore Screen Description (refer to Figure 5-7) (continued)

Key	Name	Description
8	Selected Check Box	Tap to select the individual image for restoring. Note: The check box may appear to be outside of the image itself. To locate it more easily, tap the image to select it, providing a blue background.
9	Restore	Tap to copy the images from the external storage device (images remain on the external storage device)
	Status Bar (bottom of screen) see Section 3.5 for full description	

5.8 Backup Screen

The Backup screen layout is shown in Figure 5-8. It allows the user to copy or move previously scanned images to removable storage devices (USB drive or memory card). For more information on backing up images, see Section 9.9, Backup of Images.

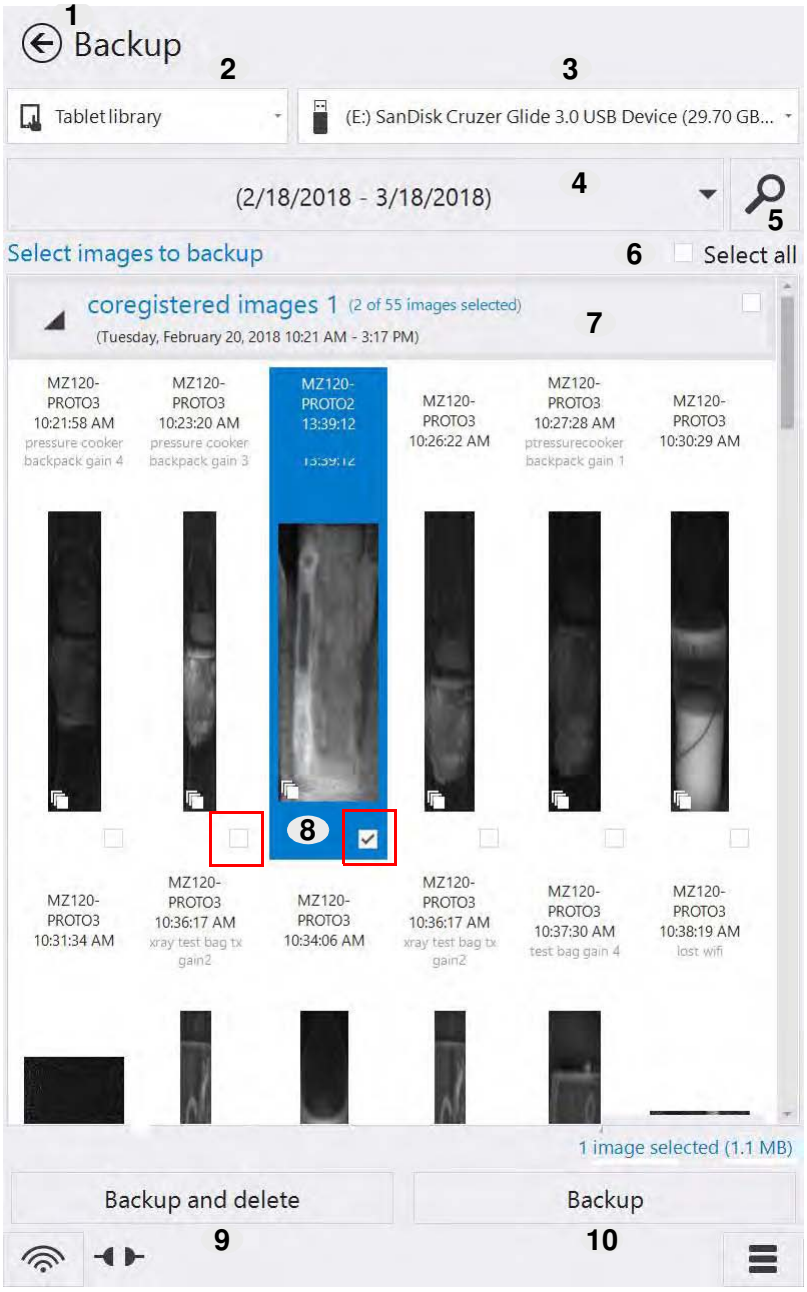


Figure 5-8: Backup Screen Layout. The buttons are described in Table 5-8.

Table 5-8: Backup Screen Description (refer to Figure 5-8)

Key	Name	Description
	Navigation Bar (top of screen)	
1	Back button 	Tap once to return to the Home screen
	Content Pane (middle of screen)	
2	Library	Tap to open a menu of image destination libraries, by image type: • To backup all selected images as normal images, choose **Tablet Library** • For images to be backed up as Reference images, choose **Reference Library**.
3	Destination Storage Device	Tap to open a menu of external storage devices that are connected to the tablet, and tap the device to use.
4	Selection Criteria	Displays the criteria used to select the images to back up. "All Images" indicates that no criteria were set. Tap to display the Search criteria, used to enter filtering criteria for finding images. For more information, see Section 9.4.3, Search Criteria Subscreen.
5	Search button 	After entering search criteria, tap to execute search for images.The contents of the galleries are updated to match the search criteria. If the search is performing a multi-variable query on a very large quantity of inspection records, there may be a delay. In that case, in the gallery area of the screen the following spinner box message appears: 
6	**Select All** check box	Tap to select all images and groups that matched the search criteria.
7	Image group headers	For each group matching the search, or images that matched the search, displays the group name of the groups, quantity of images and quantity selected from each group, and creation date and time range of the images. Tap to expand headers individually and show thumbnails of the images in the group in the gallery. Tap the check box in the header to select all or deselect all of the images displayed in the gallery under the header.
	Gallery pane, Image thumbnails	Displays groups of image thumbnails in an expandable list format. Each thumbnail is identified by the serial number of the scanner that generated the image, the image creation time and user comments. The red flag  indicates the image is marked for ease of selection or protection from deletions.

Table 5-8: Backup Screen Description (refer to Figure 5-8) (continued)

Key	Name	Description
8	Selected Check Box	Tap to select the individual image for backup. Note: The check box may appear to be outside of the image itself. To locate it more easily, tap the image to select it, providing a blue background.
9	**Backup and Delete** button	Deletes the backed up images from the tablet after the images have been copied to the destination. Tap to move the images to the backup storage device (images are removed from the tablet)
10	**Backup** button	Tap to copy the images to the backup storage device (images remain on the tablet)
	Status Bar (bottom of screen) see Section 3.5 for full description	

5.9 Checking Status

The ASEInspection Software offers contextual status information in the Status bar at the bottom of each screen (see Figure 3.5). In addition, more detailed status information is provided in two Status screens that provide real time status information about the scanner. The Status screens are available from any primary screen, by tapping the Status button in the lower corner of the screen:

- The **Status Overview** mode screen (Figure 5-5) displays basic error conditions, faults, and system warnings, if any exist.
- The **Status Details** mode screen (Figure 5-10) displays the key operational parameters, updating them in real time, and allows setting of some of them.

The **Scanner** table in the **Status Details** mode screen presents data read directly from the scanner. The scanner must be powered up and connected to the tablet in order for the data to be provided.

During active scanning, the **Scan Monitor** mode screen (see Figure 5-2) is displayed. Toggling back and forth between the **Scan Monitor** mode screen and the **Status** screens can be done quickly by tapping the Status button at the bottom corner of each of the screens.

Toggling to and from the **Status** screens from the **Scan Monitor** mode screen does not stop the X-ray emissions from the scanner. (Going to any screen other than a **Status** screen does immediately stop emissions.)

5.9.1 Status Overview Mode Screen

The Status Overview mode screen (Figure 5-5) displays basic error conditions, faults, and system warnings, if any exist. Tap the Status button to return to the previous (non-Status) screen.

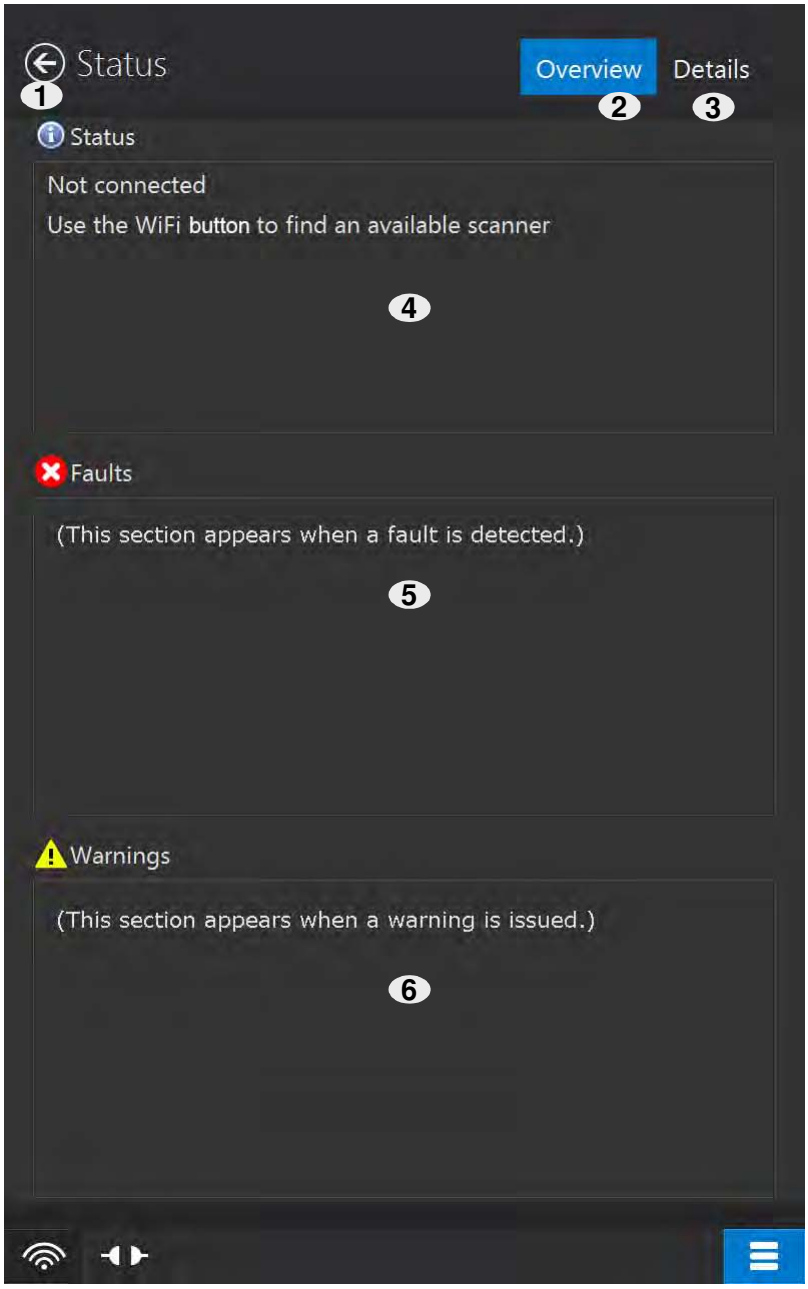


Figure 5-9: Status Overview Mode Screen Layout. The buttons are described in Table 5-9.

Table 5-9: Status Overview Mode Screen Description (refer to Figure 5-9)

Key	Name	Description
	Navigation Bar (top of screen)	
1	Back button 	Tap once to return to the Home screen
2	Overview button	Tap to open Status Overview mode screen if not highlighted
3	Details button	Tap to open Status Details mode screen
	Content Pane (middle of screen)	
4	Status display	Reports condition of scanner system
5	Faults display	Reports any current fault conditions (section appears only if faults are detected)
6	Warnings display	Reports any current warnings (section appears only while warnings are issued)
	Status Bar (bottom of screen): see Section 3.5	

5.9.2 Status Details Mode Screen

The Status Details mode screen (Figure 5-10) displays the current operational status of the key system parameters. Tap the Status button to return to the previous (non-Status) screen.

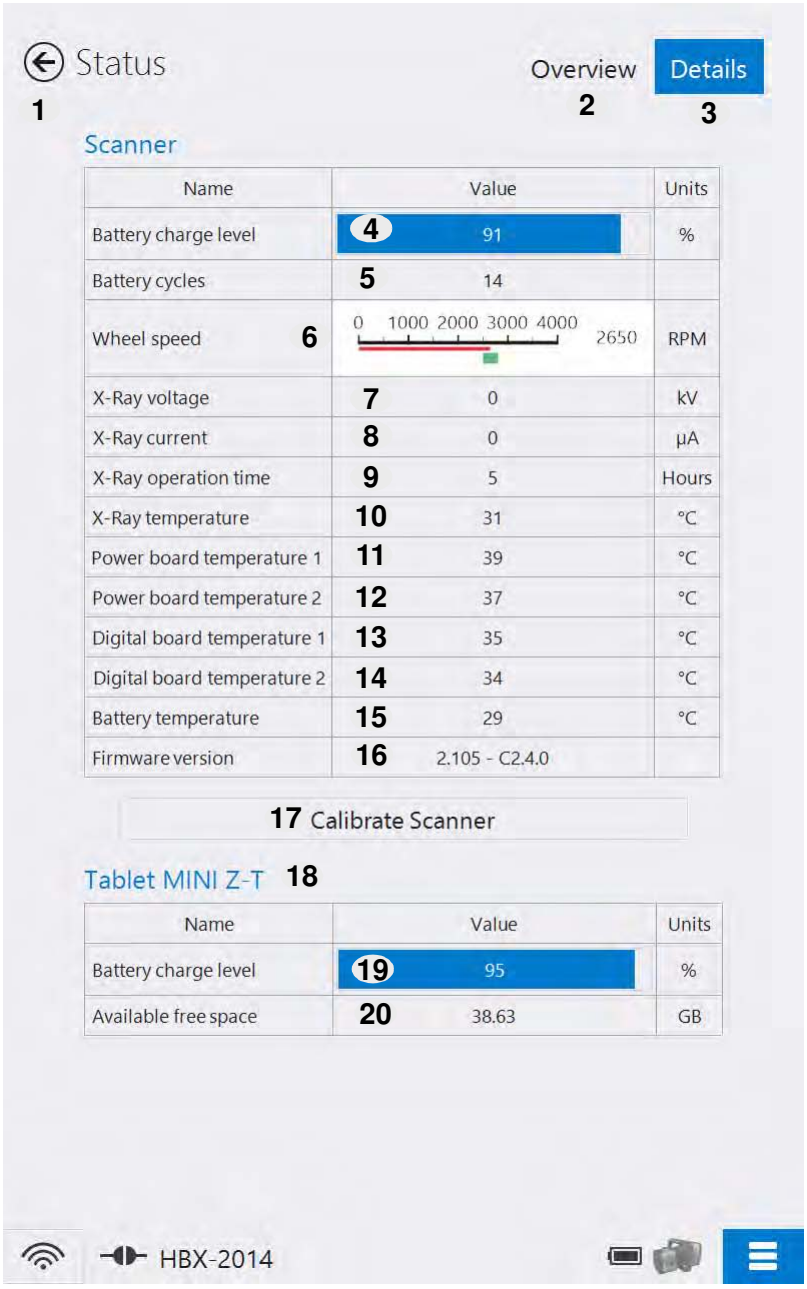


Figure 5-10: Status Details Mode Screen Layout. The buttons and parameters are described in Table 5-10.

Table 5-10: Status Details Mode Screen Description (refer to Figure 5-10)

Key	Name	Description
	Navigation Bar (top of screen)	
1	Back button 	Tap once to return to the Home screen
2	Overview button	Tap to open Status Overview mode screen if not highlighted.
3	Details button	Tap to open Status Details mode screen if not highlighted.
	Content Pane	
	(Scanner table) Scanner must be powered-on and interconnected with tablet to activate these entries	
4	Battery charge level (%)	For the scanner battery only. Uploaded from the battery memory.
5	Battery cycles	The count of how many times the currently loaded scanner battery has been recharged. Uploaded from the battery memory.
6	Wheel speed (rpm)	X-ray chopper wheel; green bar indicates safe operating range under typical conditions, red bar indicates total current speed. On the side of the scale, the current rpm is shown in numerals.
7	X-ray voltage (kV)	Valid only when X-rays are emitting; 0-70 kV ±10%
8	X-ray current (µA)	Valid only when X-rays are emitting; 0-140 µA ±10%
9	X-ray operation time (hours)	Cumulative time that the X-ray elements have been emitting.
10	X-ray temperature (°C)	Valid only when X-rays are emitting.
11	Power board temperature 1 (°C)	Diagnostic parameter
12	Power board temperature 2 (°C)	Diagnostic parameter
13	Digital board temperature 1 (°C)	Diagnostic parameter
14	Digital board temperature 2 (°C)	Diagnostic parameter
15	Battery temperature (°C)	The current temperature of the currently loaded scanner battery. Uploaded from the battery memory.
16	Firmware Version	The current version of firmware installed on the scanner.
17	Calibrate Scanner	Supervisor accounts only: Perform a system recalibration (See Section 11.8, Recalibrating the Scanner)
	Content Pane (Tablet table)	
18	Tablet name and serial number	Assigned at the factory during manufacture
19	Battery charge level (%)	For the tablet only.
20	Available Free Space (GB)	For the tablet solid state hard drive only.
	Status Bar (bottom of screen): see Section 3.5	

5.10 Settings General Mode Screen

The General screen layout is shown in Figure 5-11. It allows the user to set the appearance of the ASEInspection Software screens and create incident reports.

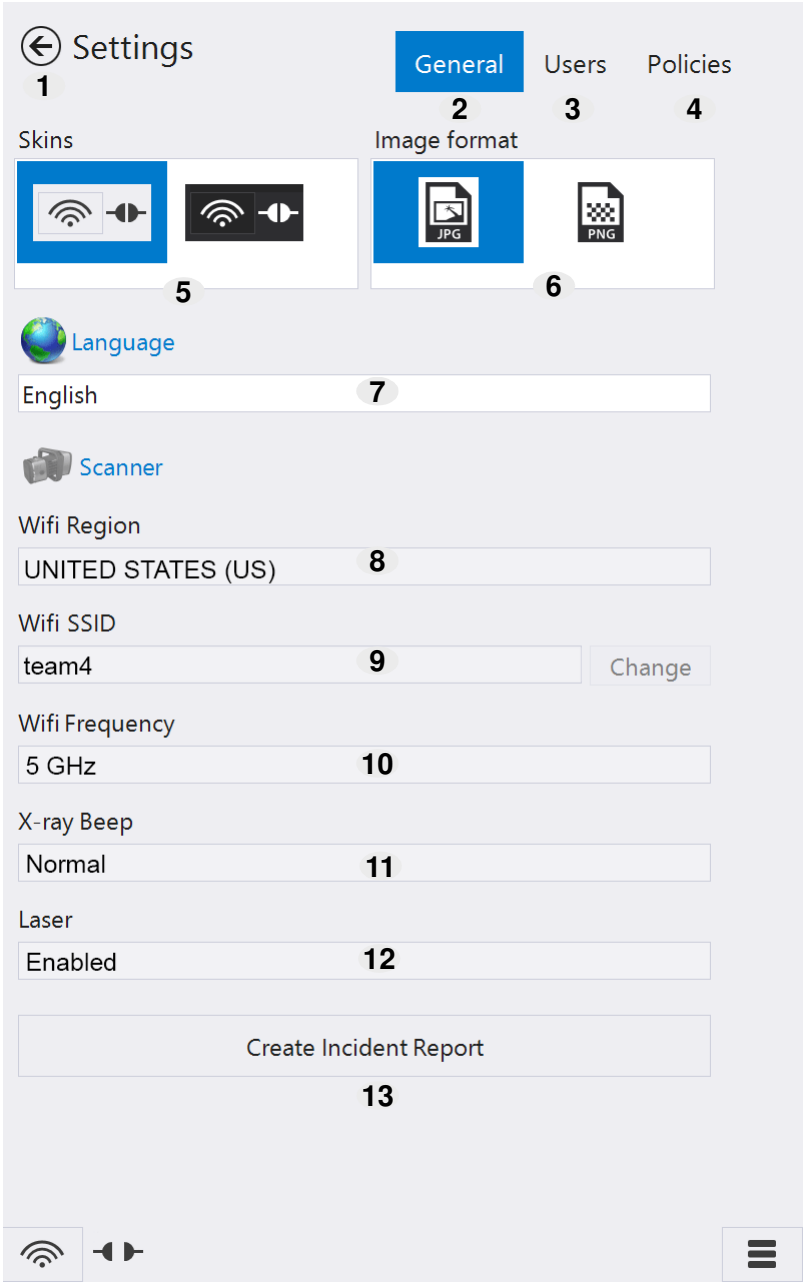


Figure 5-11: Settings General Mode Screen Layout. The buttons are described in Table 5-11.

Table 5-11: Settings General Mode Screen Description (refer to Figure 5-11)

Key	Name	Description
	Navigation Bar (top of screen)	
1	Back button 	Tap once to return to the Home screen
2	General button	Highlighted background indicates this screen is the current screen
3	Users button	Tap once to open the Settings Users Mode Screen
4	Policies button	Tap once to open the Settings Policies Mode Screen
	Content Pane (middle of screen)	
5	Skins 	Tap to set background of all screens: (left example) light, (right example) dark
6	Image Format 	Tap to set the type of file generated for exports of scan images: (left example) JPG (JPEG, lossy format), (right example) PNG (non-lossy format)
7	Language	Tap the label of the current language to open a list of the languages available on the tablet. Tap to select the new language and then tap the confirmation button (requires restart of tablet). Only appears for supervisor login accounts.
	(Scanner table) Scanner must be powered-on and interconnected with tablet to activate these entries	
8	WiFi Region	Operator and supervisor accounts: View current setting for WiFi transmission standards Supervisor accounts only: Tap to access WiFi region setting screen. (See Section 3.6.3.2, Configuring the WiFi Region)
9	WiFi SSID	Change the WiFi identifier for the scanner unit. (See Section 3.6.3.4, Confidential SSIDs for Scanners)
10	WiFi Frequency	Change the WiFi frequency band for optimum interference rejection. (See Section 3.6.3.3, Configuring the WiFi Frequency)
11	X-ray Beep	Change the audible warning pattern during scanning. (See Section 3.6.6, ASEI Audible Warning)
12	Laser	Change the laser guide beam usage during scanning. (See Section 3.6.7, ASEI Laser Guide Beams)
13	Create Incident Report button	Tap to open screen to create an incident report to submit to AS&E. For more information, see Section 11.9, Incident Reports.
	Status Bar (bottom of screen): see Section 3.5	

Chapter

6

Scan Procedure

This chapter provides a broad overview of the MINI Z™ Handheld Z Backscatter®X-ray screening system.Before performing a scan, ensure that:

- The system has been checked for operational condition; refer to Section 2.7.6, Pre-Operation System Check)
- The scan area has been checked for stray people or animals; refer to Section 2.7.5, Pre-Operation Area Check)

WARNING

The beam can pass through the target to a distance depending on the shielding, thickness, density, and distance of the objects being scanned. Before changing the orientation of the scanner, turn-off the beam by releasing the two trigger buttons on the handle, and be sure that the area beyond the object in the new beam direction is clear before turning on the beam again.

- A safe and executable scan path has been planned; refer to Section 2.7.7).
- The Ethernet cable has been connected, if used (Section 3.3.1), or the WiFi Region has been selected (Section 3.6.3).

WARNING

Be careful of the Ethernet cable.

- The shoulder strap accessory is attached to the scanner, with a tie point looped over each of the two mounting eyes on the scanner housing (see Section 11.5), and placed around a shoulder and under

the opposite arm of the user. Ensure that the straps are not frayed and the attachment clips are fully latched.

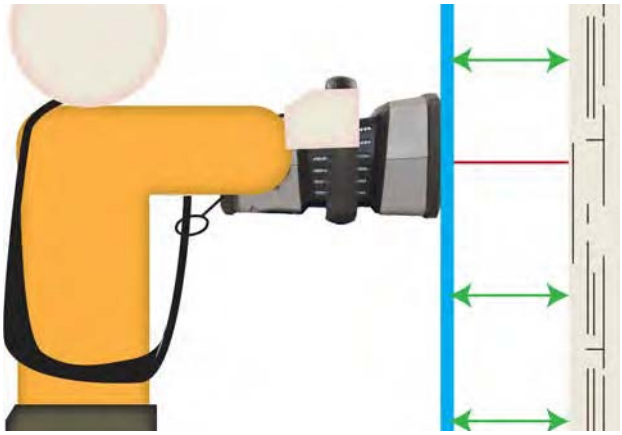


Figure 6-1: Scanner Shoulder Strap Proper Arrangement

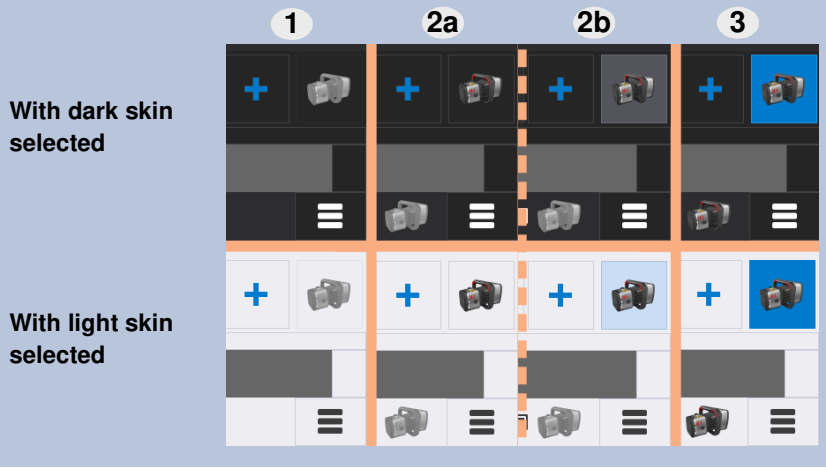
- The tablet has been turned on and the ASEInspection Software opened to the Home Screen.

6.0.1 Enabling Emissions

Near the top of the Scan Monitor Mode Screen, with a scanner connected, the Scan Enable button appears in full color  . Tap the button to enable Ready mode; the background highlights dark blue  . This enables the trigger interlock systems in the scanner, and on the scanner, the Status LED goes to steady green.

The Scan Enable button (Scan screen top) and the Enabled Status icon (Scan screen bottom) appear similar. The Scan Enable button (screen top) signals the scanner to allow emissions, and the Enabled Status icon (screen bottom) indicates the scanner status.

The following modes are indicated by the appearance of the button and the icon:
1. No scanner connected. (Connect scanner to continue.)
2a or 2b. Scanner connected, but not enabled. (Tap the Scan Enable button at top of Scan screen to enable the scanner; the button background highlights in dark blue.)
3. Scanner connected and enabled. (Press trigger button on scanner to scan for 30 seconds.)



6.1 Normal Startup

This section summarizes the normal start-up of a MINI Z system that has already been configured, as described in previous sections of this chapter. The ASEInspection Software should be currently open.)

1. Before starting the system, all users must read and understand this manual.

WARNING

The MINI Z system emits an ionizing radiation beam. In order to operate the MINI Z in a safe manner, be sure to read and understand the entire manual.

2. Charge the tablet and scanner batteries as necessary (see Chapter 12).
3. Ensure the tablet main battery pack is loaded, locked in, and that the battery power indicator LED displays green.

4. Power-on the tablet: on the tablet left side, press the Power button for less than 2 seconds of time.

5. The tablet initializes, and by default opens the ASEInspection™ Software Home Screen. If the system is configured to require a login, complete the login screen (see Section 10.1).
6. Power-on the scanner. To do so, insert the key and turn it to the On position ("|,").

7. Connect the tablet and scanner:
   a. If the Ethernet cable is being used, connect it (see Section 3.3.1).
   b. Otherwise, select the scanner WiFi transceiver, as follows:

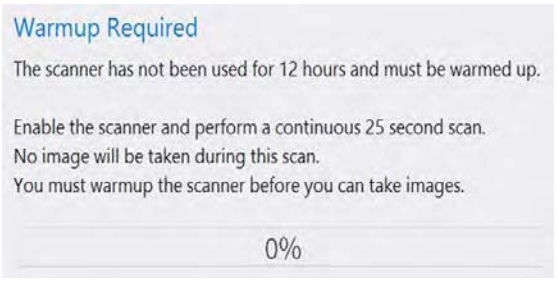
   - In the lower corner of the tablet screen, tap the WiFi Connection button to open a list displaying available scanner connections. The scanner must be powered-on to be detected.
   - Tap the text link matching the target scanner to highlight it. The links display the serial number of the Scanner, found on the label on the bottom of the scanner housing.

     After a few moments, when the connection is established, the list subscreen closes automatically, and the status indicator LED on the scanner changes to steady yellow.

6.1.1 Scanner Unit Warm-Up

This section describes warm-up of the scanner unit, which is necessary if no scan has been performed in the previous 12 hours (including if the scanner unit has been on, but without scanning). If Warm-up is required, this icon appears at the bottom of the tablet screen, indicating that a warm-up of 25 seconds of time is required. Otherwise, the system is ready for scanning; skip to Section 6.1.2, Scanning.

1. To warm-up the unit, on the tablet Home screen, tap the **Scan** button  to open the Scan Monitor Mode Screen. The **Warm-up Required** subscreen opens automatically, when required.



2. Place the Calibration Dock on a horizontal surface, and insert the scanner.

Important for emission control: Align the scanner emission face to fit the Calibration Dock collar and then insert the emission face into the Dock collar, until the front bumper of the emission face rests firmly against the bottom of the Dock recess.

Ensure that the Calibration Dock is rated for the 120kV configuration. The 120kV dock is black metal, while the earlier configurations are silver metal. Never use a Calibration dock rated for a lower kV rating

3. On the Scanner unit handle, press and quickly release one of the red trigger buttons:
   - The four "X-ray On" warning lamps on the scanner handle corners flash (red) once
   - The X-ray generation mechanism can be heard coming up to speed
   - The Status LED on the scanner housing blinks green, indicating that the system is ready for warm-up.

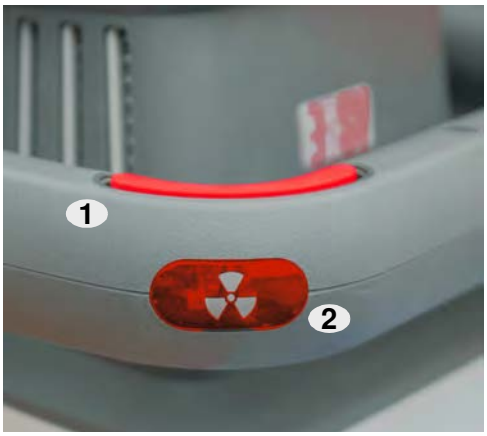
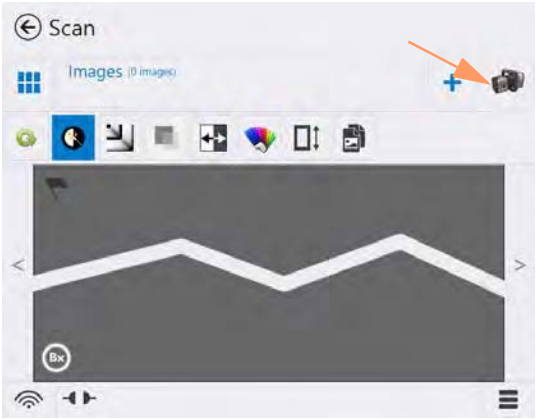


Figure 6-2: Scanner Handle. (1) Enable X-ray emissions red trigger button (one of two), (2) “X-ray On” warning lamp (one of four; illuminate red).

4. On the tablet, tap the Scan Enable button  near the top corner (the button background highlights ).



WARNING

The next step results in the emission of X-rays. The scanner must remain in the Calibration Dock, and it is good practice to ensure that no part of the user’s body is in front of the emission surface at the front of the scanner.

5. Within 35 seconds press and continue to hold either one of the two red trigger buttons on the handle of the scanner to enable warm-up. (If the time limit is not met, tap the Scan Enable button  again.) Throughout the period:
   - The four “X-ray On” warning lamps on the scanner handle illuminate (red) and stay lit
   - The X-ray generation mechanism can be heard
   - The system beeps once or continuously (according to the **X-ray beep** selection)
   - In the tablet **Warm-up Required** screen, the progress bar indicates the passage of time while the scanner performs a sequence of graduated warm-up stages.

   Note: The red trigger button must be held down throughout the entire warm-up X-ray generation period. If the red trigger button is released before the full period has elapsed, X-ray emission will stop immediately and the warm-up will have to be started again from the Scan Enable button  step.

6. At the end of 25 seconds:
   - The four “X-ray On” warning lamps on the scanner handle extinguish.
   - The system beeps twice.
   - The tablet **Warmup Required** screen closes.
   - The Status bar Warmup Required icon  is no longer displayed.
7. Release the red trigger button.
8. Remove the Calibration Dock and store it for the next use.

The system is now ready for normal scanning. Refer to Section 6.1.2, Scanning.

6.1.2 Scanning

This section assumes that the MINI Z system has been configured, powered-on, interconnected, and warmed-up if necessary (see Section 6.1, Normal Startup). The following steps summarize the process of scanning. For more information on scanning, see Chapter 7, Advanced Scanning.

WARNING

Check the scan area for personnel beyond the object being scanned or near the beam path. Note: Never turn on X-rays if there are people or animals directly in the path of the X-ray beam.

1. Before performing scans, all users must read and understand this manual.

WARNING

The MINI Z™ system emits an ionizing radiation beam. In order to operate the MINI Z in a safe manner, be sure to read and understand the entire manual.

2. On the tablet Home Screen, tap the **Scan** button  . The Scan screen opens (typically, the Scan Monitor Mode Screen opens. If the Scan Gallery Mode Screen opens, this procedure is not affected, and the screen automatically changes to the Scan Monitor Mode Screen when scanning starts.)

   Note: If a warm-up has just completed, when the **Warm-up Required** screen closes, the **Scan** screen remains open.

3. At the top of the screen, tap the Add Group button  . A subscreen opens.
   a. If multiple imaging will be used, tap and drag the  slider so the adjacent label reads "**On**." Otherwise, set the slider to indicate "**Off**" (see Section 7.2, Multiple Image Scanning (Manual Stitching)).
   b. In the **Group Name** text box, tap in the box to display the on-screen keyboard.
   c. Type a group reference title (see Section 7.5.2, Image Groups).
   d. Tap the **OK** button. The subscreen closes.
   e. In the on-board keyboard top corner, tap the **X** button. The keyboard closes.

4. At the top corner of the screen, tap the Scan Enable button  to enable the safety interlocks in the scanner for emitting X-rays. The Scan Enable button background highlights  and the interlocks are enabled for a maximum of 30 seconds of time.

If the scan does not begin, the scanner may have reverted to Standby mode. The Status LED (rearmost status light) on the scanner body would be steady yellow. At the bottom of the tablet screen the Standby mode icon displays. Press and release a red trigger button on the scanner handle to repower the circuits and then press the Scan Enable button again.

- If the Status LED is flashing green, the user has delayed too long between scans, and after 30 seconds of time, the scanner has returned to disabled state. Tap the Scan Enable (top) button to enable scanning again.
- If the Status LED turns steady yellow, the user has delayed for more than 10 minutes between scans, and the scanner has returned to power-saving Standby mode. To continue, press and quickly release a trigger button on the scanner handle. When the Status LED on the scanner housing turns blinking green, tap the Scan Enable (top) button again.

5. Orient the scanner at the beginning of the scan path, with the scanner bottom perpendicular to the path, and the emission face toward object (see Figure 6-3).

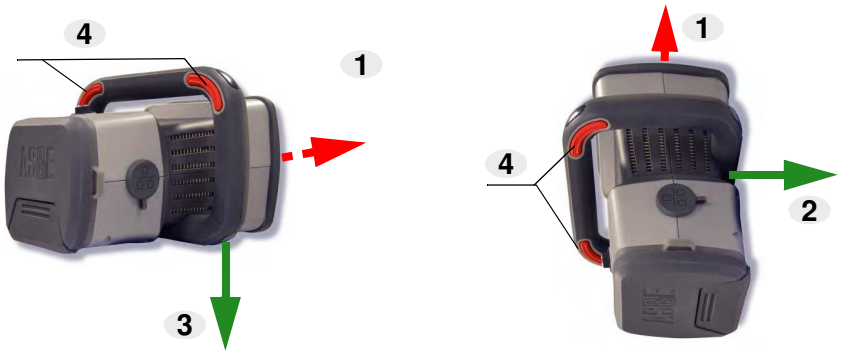


Figure 6-3: Scanner Primary Orientations. (1) Direction of object being scanned (no persons or animals should be in this direction), (2) Direction of movement along a horizontal scan path, (3) Direction of movement along a vertical scan path. Note the position of the scanner handle and (4) the trigger buttons.

WARNING

The next step results in the emission of X-rays.

6. Press and hold either of the two red trigger buttons on the scanner handle (shown in Figure 6-2). To signify that X-rays are being emitted:
   - The four “X-ray On” warning lamps on the handle illuminate (red),
   - A warning beep sounds,
   - Two beam width warning lasers emit from the scanner face, and
   - The Radiation icon appears in the Status bar.
7. Move the MINI Z through the scan path (posture shown in Figure 7-1 and scanning grid pattern in Figure 7-2). Move at approximately 6 inches (15cm) per second.
   To minimize distortion in the image, hold the front surface of the scanner at a uniform distance and orientation relative to the surface of the object being scanned (see Section 7.1, Avoiding Distortion).
   Scans are automatically saved when they are generated, and appear in the Scan screen as they are being generated.

The optimum separation between the scanner face and the surface of the object being scanned depends on the object being scanned. The scanner can typically return images when operated from 0 inches (contact with the surface) out to more than18 inches (46 centimeters) from the surface of the object. For many applications, an optimum distance is approximately 4 to 6 inches (10 to 15 centimeters).

8. At the end of the path, release the trigger switch (both switches should be released) to stop emitting X-rays. (Note: Emissions stop automatically after a maximum of 30 seconds.)To signify that X-ray emissions have stopped:
   - The four “X-ray On” warning lamps on the handle extinguish,
   - Two warning beeps sound,
   - The two beam width warning lasers extinguish, and
   - The Radiation icon in the Status bar is hidden.
9. Repeat steps 2 through 7 for multiple scans. (If each new scan starts within 30 seconds of the previous scan ending, only steps 6 and 7 are required.)

Tapping the Scan Enable (top) button  again during an active scan emission shuts off X-ray emissions immediately. This is a safety feature for two-user configurations, allowing the user holding the tablet to shut down emissions when necessary.

10. View and enhance current images at any time in the tablet **Scan** screen or **Review** screen.

6.1.3 Shutting Down

When shutting down the system, either the tablet or the scanner can be shut down first.

CAUTION

If the tablet is shut down while a scan is being taken, the scan data may be lost.

- To shut down the tablet when the ASEInspection Software is being displayed in the touchscreen, return to the Home Screen, then at the top of the screen, tap the **Exit** button ⊗ . After the ASEInspection Software closes, the tablet automatically shuts down.

11. To shut down the scanner, turn the key to the Off ("O") position, and optionally remove the key for secure storage. This powers-down the scanner completely.

If the tablet is shut down before the scanner is shut down, then communication between the tablet and the scanner is broken and X-ray emissions are automatically disabled within two seconds. After ten seconds, the scanner will enter into Standby mode (the Status LED on the scanner housing becomes steady yellow).

After the scanner is turned off, determine if the scanner battery or tablet battery should be recharged, or if the scanner battery has reached the recharge limit. (For more information, see Chapter 12, Battery Care.)

Store the system in the Rugged Transport Case provided, in a moderate temperature and humidity location.

Chapter

7

Advanced Scanning

This chapter describes the procedures supporting performance of a scan. It introduces techniques to ensure distortion-free imaging, and methods for sequencing the scan images for maximum accessibility.

WARNING

Safety precautions and safe operating procedures are described in detail in Chapter 2, System Safety.

For a complete description of interpreting and enhancing images captured by the MINI Z, refer to in Chapter 8, Image Review. For a complete description of storing images, refer to in Chapter 9, Image Management.

This section describes techniques to ensure distortion-free imaging, as well as other steps to prepare for scanning.

7.1 Avoiding Distortion

While performing a scan, in order to produce the highest quality of image possible, it is important to keep the beam properly oriented, straight toward the object being scanned, and at a constant distance from the object. This is illustrated in Figure 7-1. Otherwise, if the beam is swung at an angle to the object, or moved closer or farther away from the object during the scan, or moved with varying speed, distortion of the image can result.

Do not rotate the scanner relative to the scan path. If scanning a wide object in multiple scans, the individual scan paths should be parallel in order to ensure proper interpretation of the orientation in the images. Think about keeping the bottom of the scanner leading the scanner along the scan path, and think about keeping the bottom surface of the of the scanner face perpendicular to the scan path all the way through the scan.

The scanner projects low-power laser beams from the emitter surface of the scanner, toward the object being scanned. These guide beams can help the user maintain orientation. These also provide a reference safety indication around the X-ray beam path.

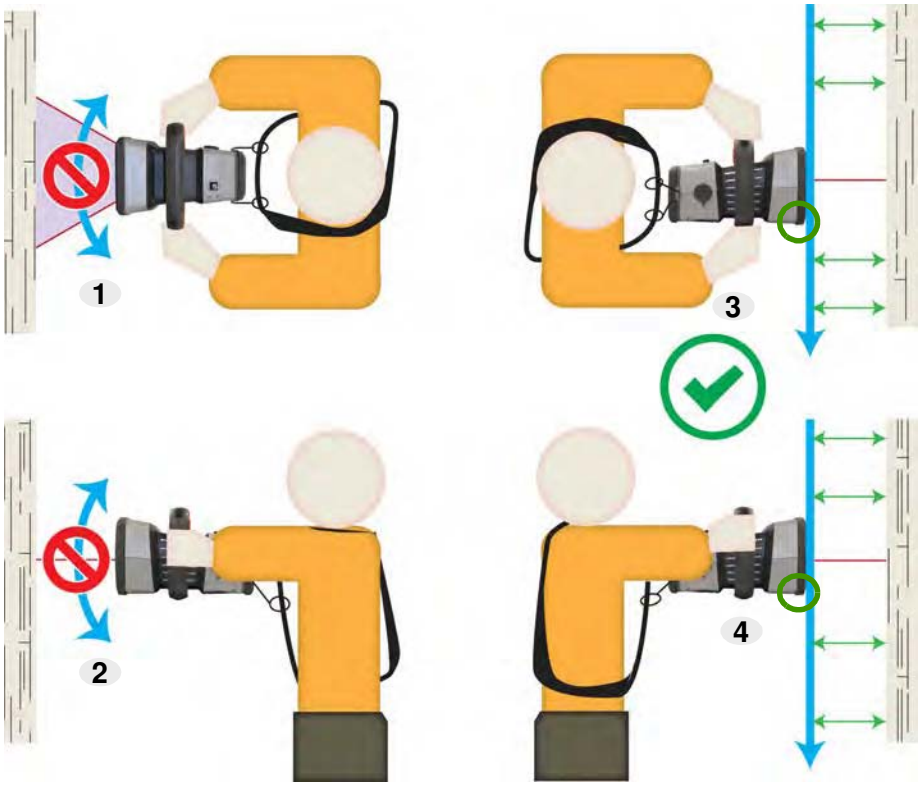


Figure 7-1: To avoid distortion in the final images, move the scanner at a constant speed. About 6 inches (15 centimeters) per second of time is a normal rate. Slightly slower rates give increased resolution. In addition, keep the front of the scanner perpendicular to the target, avoiding rotation (1) side-to-side, or (2) up or down.

To ensure all of the final images have the same orientation and scale, always move with the bottom edge of the scanner emitting face leading the way, keep a constant distance About 6 inches (15 centimeters) between the front of the scanner and the target surface while moving consistently (3) left-to-right for sideways scan paths, or (4) top-to-bottom for vertical scan paths. The ASEInspection Software keeps track of the sequence of images in each image group. Scans are saved automatically.

The black object demonstrates the use of the safety shoulder strap. It is worn loosely over one shoulder and under the opposite arm. The scanner is attached by loops (see Section 11.5, Connecting the Scanner Unit Shoulder Strap) that slide along the shoulder strap, for ease of motion.

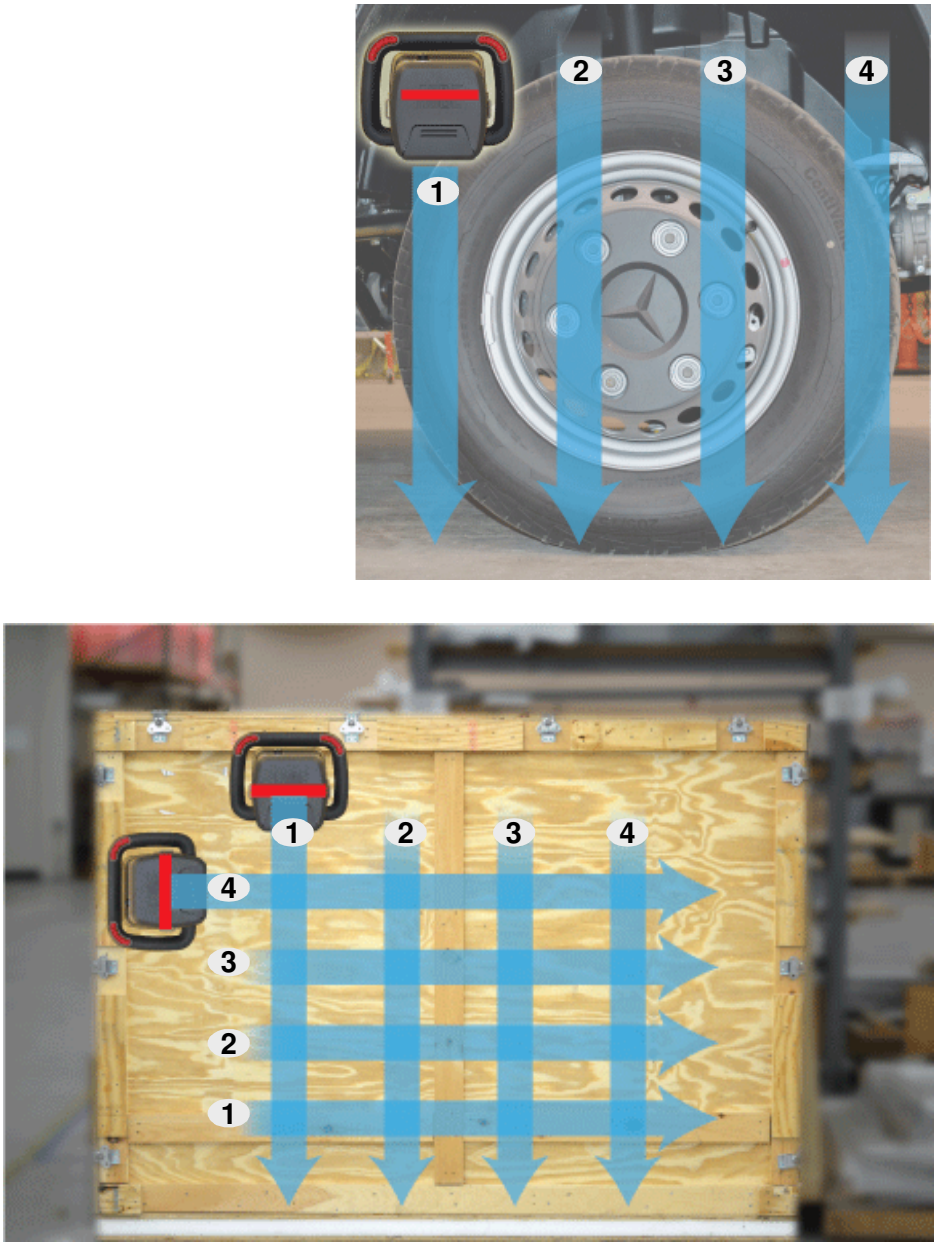


Figure 7-2: To avoid distortion in a scanned image, keep the scan line (the red plane) perpendicular to the scan path (blue), with the scanner bottom going first (for consistency). The upper panel shows a scan path across a vehicle tire (not following the circle of the tire allows multiple image manual stitching, Section 7.2). The lower panel shows how to cover a large area. Use either a horizontal or vertical pattern (as convenient) of individual scans, making sure each scan is in the same direction, parallel, and in sequence down or across, so the MINI Z™ automatic sequencing features can be used for orderly tracking.

7.2 Multiple Image Scanning (Manual Stitching)

For scanning a wide area, the system provides the Multiple Images function, with the following characteristics:

- As many as 4 full-width scans can be included as multiple images in one scan group, locked in perspective together, and viewed and exported at the same time.
- Each additional scan is automatically added after the previous scan if no previous scan in the group has been selected.
- If the operator taps a previous scan in the group (a blue border appears), that scan is selected for replacement when the next scan is started.
- After a replacement scan, to continue adding new scans, up to 4, start a new scan. It will automatically be added at the last position.
- After 4 scans have been created, any additional scan replaces the scan in the 4th position (unless the operator selected a previous scan for replacement, as described above).
- The individual scan images in a group can be “manually stitched;” the operator can interactively manipulate the images to align with each other, providing broad area composite views.
- Individual scans are initially displayed at a consistent resolution, optimal for a 6-inch per second scanning rate.
- After initial creation, if aspect ratio control is disabled   , individual scan images can be zoomed and aspect ratios adjusted interactively for optimum matching between scans.
- After initial creation, if aspect ratio control is enabled (blue background)  , individual scan images can be stretched or compressed vertically by pinching or spreading with two fingers.
- When all of the scans are arranged correctly, in the top corner of the Image area, tap the Lock button. This toggles freezing the arrangement.  indicates the arrangement is locked, and  indicates that the arrangement is unlocked.
- When the scans are locked  , the entire group can be panned vertically (but not sideways), by tap-and-dragging any one of the scans upward or downward in the screen. Scans cannot be panned individually, and aspect ratio is frozen in the vertical as well as the horizontal directions.
- Individual scans in current groups can be rescanned (see Section 7.2.4, Rescanning) or replaced.
- All image enhancements are available for Multiple Images groups.
- Each enhancement is applied to all the scans in the same Multiple Images group.
- There is no practical limit to the quantity of Multiple Images groups that can be created.
- Exporting applies to the entire group. A combined image is added that includes all of the scans in the group, aligned, proportioned, and sequenced as in the screen at the time of export (Figure 7-5).

Groups that were created as Multiple Images groups display the four vertical-bar icon in the group header.

Search criteria, back-up, restore, and deletions are applied only at the Multiple Images group level. Although comments can be created at the individual scan level, they are applied at the group level. If no individual scan is selected when a comment is added, it is automatically applied to all of the scans in the group. The same is true of Flags.

7.2.1 Selected Image Highlighting

A blue border around an individual image in a Multiple Images group in the Scan Monitor Mode Screen indicates that scan has been manually selected. When an individual scan is selected, it can be resized interactively. Also, if the group is still active (has been created during the current calender day) a heavy blue border indicates that the selected individual scan will be replaced if another scan is taken.

In the Scan Monitor Mode Screen, when no individual scan has a blue border, and if the group is still active (has been created during the current calender day), and fewer than 4 individual scans are present in the group, then the absence of a blue border indicates that the next scan will be added after the last current scan (if any). If the group is not still active (was created before the current calender day), then the absence of a blue border simply indicates that no individual scan in the group is currently selected.

A blue background around an individual image in a Multiple Images group in the Scan Gallery Mode Screen indicates that scan has been manually selected. When an individual scan is selected, if the user taps the Mode button , the Scan Monitor Mode Screen opens, with that individual scan selected. If the group is not still active (was created before the current calender day), then the absence of a blue border simply indicates that no individual scan in the group is currently selected.

In the Scan screens, an image is always automatically selected (except while actively scanning a Multiple Images group). In the Review screens, images are selected only if manually selected. When working with Multiple Image mode groups in a single image screen (Monitor mode in a Scan screen or View mode in a Review screen), an individual image is only one of from one to 4 images in the Content pane. Only the selected individual image is highlighted by a blue border (Figure 7-3).

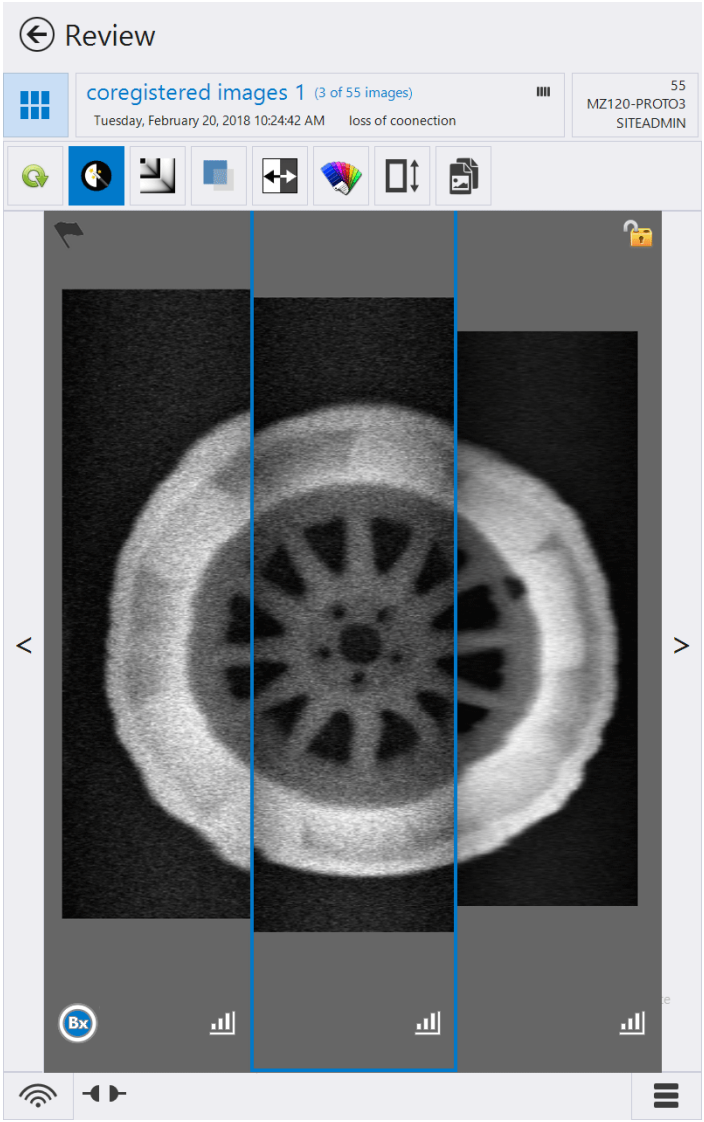


Figure 7-3: Multiple Image Group Example. The single image is selected by tapping once, and the blue selection border surrounds only that image.

When working with any images in a gallery image screen, an individual selected image is indicated by a filled blue box (Figure 7-4). This image can be viewed in a single image screen by double-tapping that image in the gallery view. If the selected image is in a Multiple Image group, the entire group appears in the single image mode view, but the selected individual image continues highlighted.

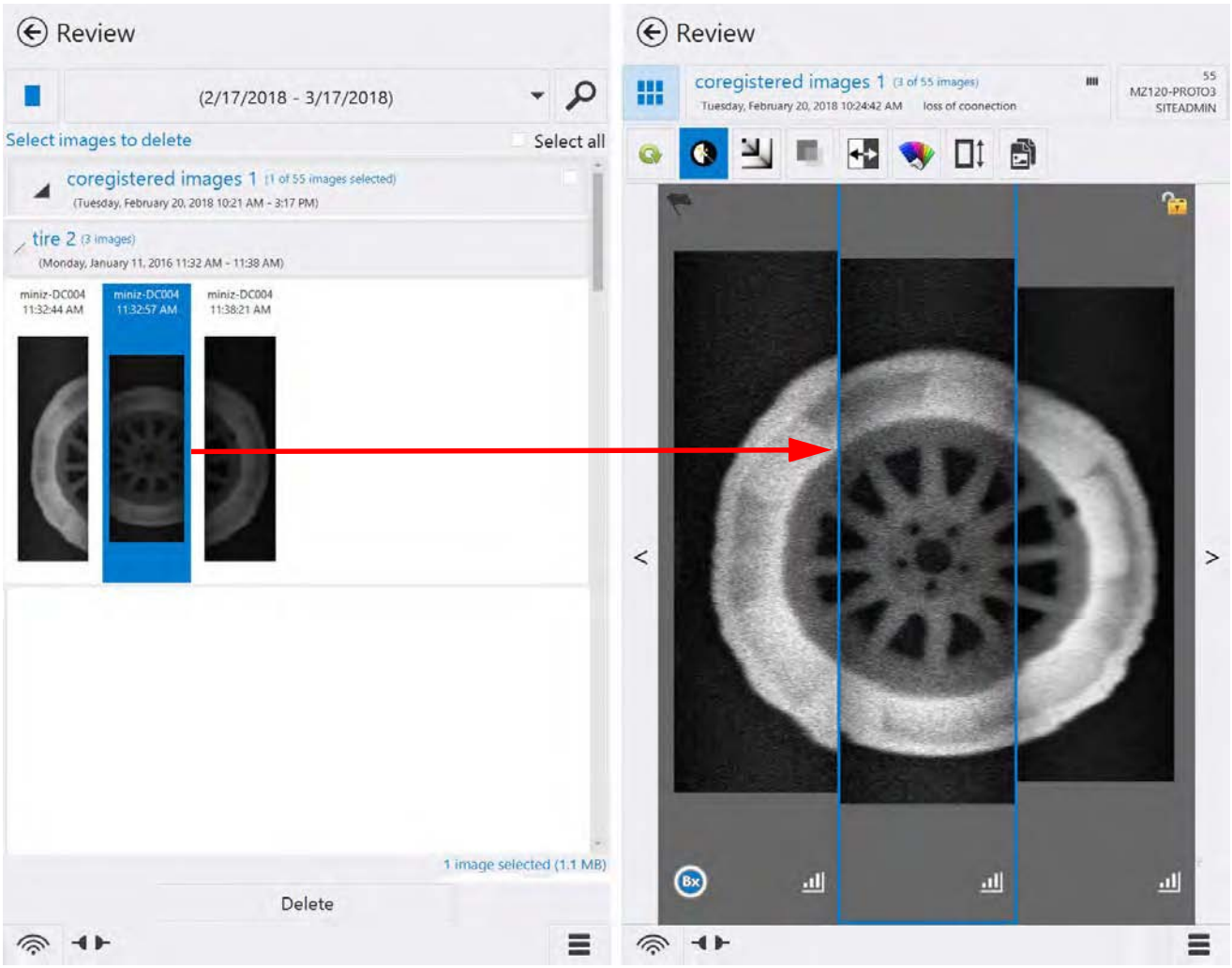


Figure 7-4: Gallery Screen Example. (Left) In a gallery view (Scan or Review screens), the single image is selected by tapping once, and the blue selection box surrounds only that image. Double-tapping opens the image in the single-image mode, but if the group is a Multiple view group, the entire group of images is displayed in the single-image screen, with the selected individual image still highlighted, with a blue border

Multiple Image groups appear as individual scans in the Scan Gallery mode screen. Double-tap any image in the group, and the entire group opens in the Scan Monitor mode screen.

7.2.2 Multiple Images Scan Set-up

The typical target for Multiple Images scanning is a wide panel, such as a shipping crate or a false wall that could be concealing contraband in a deep compartment. By creating and comparing multiple scans, the operator can detect large scale profiles of objects behind such barriers. For example, a bottle could have a profile that appears as a single linear feature in a single scan, but would present complete contours when viewed across several sequential scans.

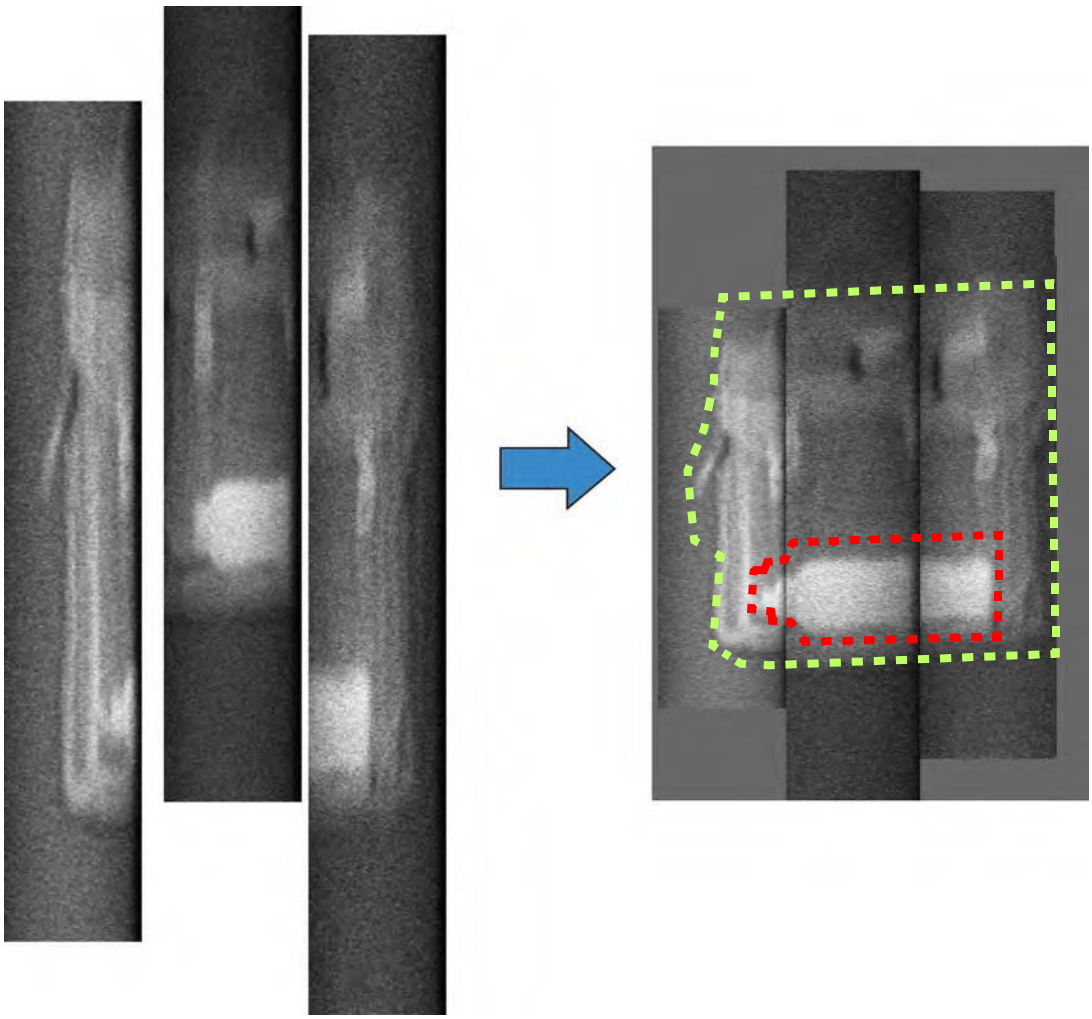


Figure 7-5: Multiple Image Function and Exported Images. (Left) Exported original images. The raw individual scans can vary in length and starting point, depending on the technique use. (Right) Exported group image. The group image shows the result of the operator interactively adjusting the alignment and proportions of the images, allowing subtle patterns to become more perceptible natural profiles (here, of a gas cylinder in a briefcase).

To enable multiple imaging, a scan image group must be configured for multiple images when the group is created. For information on image groups in general, see Section 7.5.2, Image Groups.

To create a Multiple Images scan group, perform the following steps:

1. In the Home Screen, tap the **Scan** button  . A Scan screen opens (Scan Monitor Mode Screen or Scan Gallery Mode Screen).
2. Near the top of the Content pane, tap the Add Group button +. The **Group Name** text entry box opens (Figure 7-6).

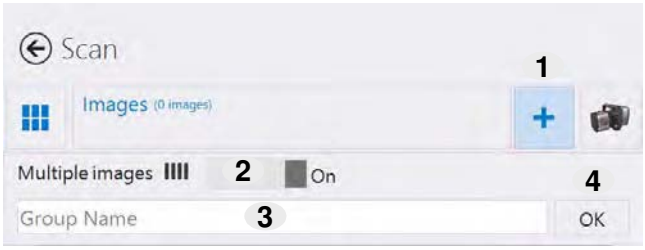


Figure 7-6: Scan Group Creation. (1) Add Group button, (2) Multiple Images enable slider, (3) Group Name text entry box, and (4) OK button.

3. Tap inside the **Group Name** text box to enable the on-screen keyboard, and type the name for the new group.
   The group name cannot be modified after the group is created.
4. To set multiple images:
   • To enable multiple images, in the **Multiple Images** slider control, tap the control to toggle the slider position until the value changes to "**On**."
   • To disable multiple images, in the **Multiple Images** slider control, tap the control to toggle the slider position until the value changes to "**Off**."
5. Tap the **OK** button to save the name and close the box; the group name appears in the current scan group name field.
6. If the group is created as a Multiple Images group, the four-bar icon appears in the group header.

While scanning, always keep accurate count of the quantity of scans taken in a Multiple Images group. Only 4 scans can be retained in a group.

After 4 scans are created, each additional scan will overwrite an existing scan. If no scans are manually selected, each additional scan overwrites the fourth scan. If a scan is selected, any additional scan overwrites the selected scan.

7.2.3 Adjusting Multiple Images Scans

After scanning an image, the operator can immediately adjust the individual scan (such as to match an adjacent scan). Each scan in the group is allocated an equal section of the screen.

- To move an individual scan within the section, such as to align to other scans, tap and drag with one finger (item 1 in Figure 7-7).
- Zooming In and Out (changing magnification proportionally)
  - To zoom in on an individual scan, on the Enhancements tool menu (Figure 8-1), ensure the Aspect Ratio enhancement tool button is disabled (has a default background ), and then tap on that scan with two fingers together and spread the fingers vertically (item 2 in Figure 7-7).
  - To zoom out of an individual scan, on the Enhancements tool menu (Figure 8-1), ensure the Aspect Ratio enhancement tool button is disabled (has a default background ), and then tap on that scan with two fingers spread apart vertically and pinch the fingers together in a vertical motion (item 3 in Figure 7-7).

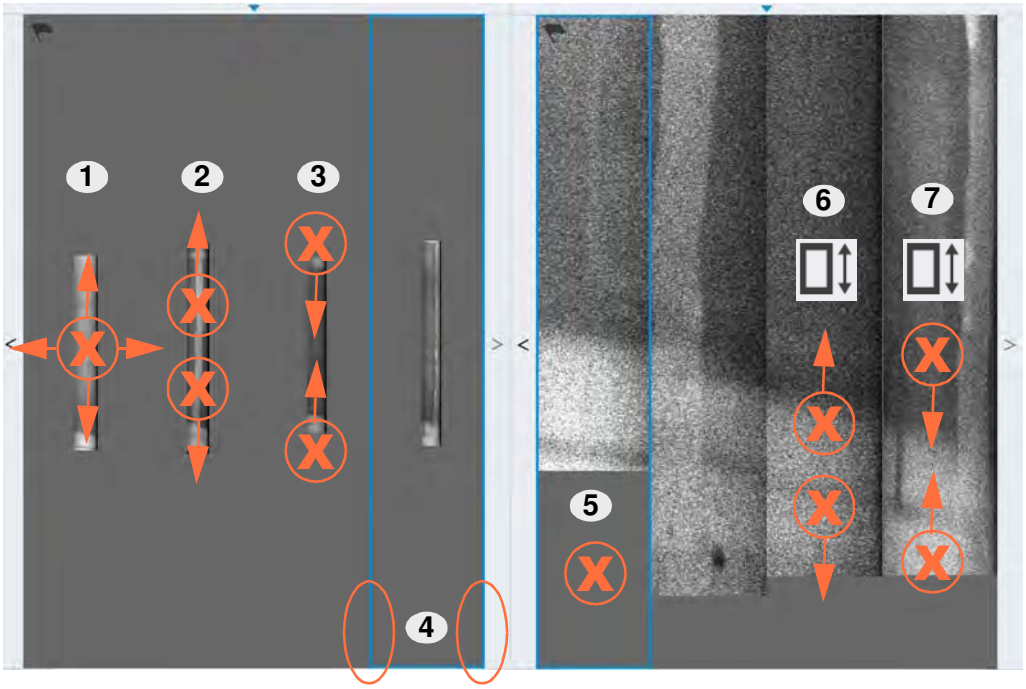


Figure 7-7: Multiple Image Adjustments. (1) Move – Tap and drag. (2) Zoom In (enlarge proportionally) – Two-finger tap and spread. (3) Zoom Out (compress proportionally) – Two finger tap and pinch. (4) Selected scan section border is blue. (5) To add to the image, re-scan (Section 7.2.4). (6) Stretch Vertically – Aspect Ratio image enhancement, then two-finger together tap and spread. (6) Compress Vertically – Aspect Ratio image enhancement, then two-finger spread tap and pinch.

- To stretch an individual scan vertically only, on the Enhancements tool menu (Figure 8-1), ensure the Aspect Ratio button is enabled (has a blue background ), and then tap to select the scan section with two fingers together and spread the fingers vertically (item 6 in Figure 7-7).
- To compress an individual scan vertically only, on the Enhancements tool menu (Figure 8-1), ensure the Aspect Ratio button is enabled (has a blue background ), and then tap to select the scan section with two fingers together and spread the fingers vertically (item 6 in Figure 7-7).

7.2.4 Rescanning

Individual scans can be rescanned or replaced with a new scan in a current Multiple Images group. The new scan occupies the same sequence position as the scan it is replacing.

- To select an individual scan for rescanning or replacement, tap the scan section. The border of the selected section changes to the color blue (item 4 in Figure 7-7).
- Scan groups are accessible in the Scan Gallery Mode Screen and the Scan Monitor Mode Screen throughout the calendar day when the scan group was created. While the groups are in the Scan screens, they can be reopened for rescanning.
- If an individual scan image is selected from a Multiple Images group in the Scan Gallery Mode Screen (a blue background appears around the selected scan image), or in the Scan Monitor Mode Screen (a blue border appears around the selected scan image) when the Scan Enable button  is tapped, that same scan image is automatically overwritten by rescanning.

• When a newly created scan group is active, while there is an open section for a scan and no scan has been manually selected for replacement, the new scan will be placed in the next empty section, up to four scans.

• Only four scans can be retained in a group. After four scans are created in a new group, the fourth scan remains selected and each additional scan will overwrite the fourth scan unless a different scan is manually selected.

• After a Multiple Images scan group has been closed, if it is reopened, the operator should explicitly select the scan to be rescanned, to ensure no other scan is still selected.

• To reopen a closed Multiple Images scan group that was taken earlier on the same day, in the Scan Gallery Mode Screen, tap the group header to open the gallery view of the group, and then tap the specific scan to be rescanned. During the rescan, the screen will automatically switch to the Scan Monitor Mode Screen.

7.3 Aspect Ratio Control

When operators perform scans, they can increase scan resolution by moving the scanner at a slower rate. This can result in a smoother image, but it can have the effects of stretching the image and obscuring the natural profile of the object being scanned. To allow the operator gain the best of both approaches (normal and slow scan speeds), the Aspect Ratio function allows the operator to perform

the scan at the optimum slow speed, then adjust for scan speed by quickly correcting the aspect ratio to regain natural-looking profiles.

The Aspect Ratio function is enabled using a button on the Enhancement Tools menu (Figure 8-1) in the Scan screen:

- When the button has the default background  , the Aspect Ratio function is disabled, and when the operator stretches or compresses the scan image vertically, the normal zoom in and zoom out action occurs (the scan image height and width change proportionally at the same time).
- When the button has a blue background  , the Aspect Ratio function is enabled.

When a Multiple Images group is open, the Aspect Ratio tool state applies to all of the scan images in the group. The adjustments are applied to each of the scan images individually,

For scanning a complex or deep area, being able to scan in higher resolution provides the following benefits:

- Set a slower imaging rate interactively, by setting a very wide aspect ratio.
- Slow the rate at which the operator moves the scanner over the target, to allow more detailed imaging.
- Each new scan displays at a consistent resolution optimized for a scan rate of 6 inches (15cm) per second of time. This provides a frame of reference replacing scans or adding scans.

7.4 Operational Considerations

- When each scan is completed (by the release of the trigger buttons or by time-out), the image on the screen is automatically zoomed out to show the whole scan.
- Moving from the Scan screen to any other screen automatically disables X-rays. The only exception is moving between the Scan screen and the Status screens. In that case, it is possible to move back and forth between these screens (by tapping the Status button  in the lower corner of the screen) without interrupting scanning. This allows the user to check the status of the system while the scanner is in operation.
- The live image is enhanced by default with the Dynamic Contrast function. This automatically optimizes image quality by continuously updating image contrast (density) according to what is currently visible in the scan view. This can result in the image shifting darker or lighter, which is normal as it compensates for extremely light or dark areas that come into the current view. The automatic function can be temporarily disabled, and manual contrast control and zoom can be used to closely examine particular areas of interest or to set the overall contrast at a fixed level, and then the function will enable again automatically at the next new scan. For more information, see Section 8.1.3, Dynamic Contrast.
- If the tablet enters sleep mode, the scanner can continue to be powered-on, but X-ray generation is prevented. Sleep mode is indicated by the table screen turning off (screen appears blank). To

awaken the tablet, press and release the Power button  on the side of the tablet (for location see Figure 4-3). Login may be required (see Section 10.1, Login Screen).

- If it becomes necessary to reposition the user's grip on the scanner during the scan, release the trigger buttons while repositioning, and then after repositioning, start a new scan. Although this completes the scan path in segments, the MINI Z automatically keeps track of the scan images in time sequence. Continuing to scan in the same direction makes it easier to compare the images later.
- Lapses in operation cause the scanner to enter Standby mode, indicated by the Status LED on the scanner housing turning steady yellow (see Table 4-2), and in the tablet Status bar, the Scanner Standby Mode Status icon  appears. After 10 minutes without performing a scan, the scanner enters Standby mode, and the four "X-ray-On" warning lights on the scanner handle flash once, and the X-ray generating mechanism powers down, to save battery power in the scanner.To waken the scanner from Standby mode, press a trigger button on the scanner handle, and release it immediately. The Status LED on the scanner turns to flashing green while the scanner is waking.
- If the tablet goes into Sleep mode, but remains connected to a scanner, it does not cause the scanner to enter Standby mode. Instead the four red LED "X-ray On" indicators on the scanner handle flash once, and the Status LED on the scanner housing blinks yellow, indicating it is in Seeking mode.
- The tablet and scanner must remain interconnected for scanning to occur. If both the Ethernet and the WiFi links are broken for more than two seconds of time (the Interconnect status button appears widely separated ), the four "X-ray on" LEDs on the handle flash once, and the scanner automatically enters Seeking mode, with the Status LED on the scanner blinking yellow. After 10 minutes, the scanner enters Standby mode, with the Status LED on the scanner turning steady yellow.
- Scanner trigger switching is sensitive to time:
  - At least one of the two trigger buttons must be held down at all times during a scan. Otherwise, if both are released, the X-ray emissions immediately stop, although the scanner does not enter Standby mode for 10 minutes.
  - If a scan takes longer than 30 seconds of time, the emissions stop automatically to protect the system. To continue, immediately release both of the emissions triggers, and then within another 30 seconds, press the trigger buttons to start a new scan.
  - If there is a delay of more than 30 seconds between releasing the trigger buttons on the scanner handle (ending a scan), and pressing them again (starting the next scan), the triggers are disabled. To again enable the trigger buttons, tap the Scan Enable button  at the top of the tablet Scan Monitor Mode Screen. The trigger buttons are then enabled for another 30 seconds.
- The image is retained for display in the Scan screen until the next scan begins:
  - Optionally, to apply enhancements to the scanned image, tap the Enhancements toolbar buttons on the top of the Scan Monitor Mode Screen Content pane, and set enhancements (see Section 8.1, Viewing and Enhancing Images).
  - Optionally, to add a comment to the scan at this time, tap just above the Content pane. A text entry box opens for adding a comment (see Section 7.5.3, Adding Comments to Scan Images).

- Optionally, to view all of the scans in the current scan group at the same time in a gallery view, tap the Mode button to open the Scan screen in Gallery mode (see Section 5.3, Scan Gallery Mode Screen). Tap the **Mode** button again to return to the Scan Monitor mode screen.
- Optionally, to open a Reference image for ongoing comparison to the scans, tap the Back button to return to the Home Screen. and then tap the **Review** button. When the Review screen opens, tap the Mode button to change to the Search mode of the Review screen (see Section 9.4, Searching for Images). To search for Reference images, in the search criteria (see Figure 9-8) select the check box next to the **Reference images** criterion.
- Ambient lighting conditions between bright and dark rooms and times of day can make it difficult to view the screen elements on the tablet. It is possible to switch between light and dark color schemes at any time between performing scans. Using the **Settings** > **General** > **Skins** area, there are two buttons: light background, and dark background.

For looking at scan images in particular, another method is to apply the Reverse Video imaging enhancement in the Scan Monitor Mode Screen or Review View Mode Screen. The Windows **Action Center** (Section 3.7.6) and the tablet Dashboard functions (Section 11.2) allow for changing screen brightness to a limited extent.

7.5 Annotating Scan Images

7.5.1 Image Physical Correlations

While performing a scan, each time the X-ray beam is started and stopped, a separate image is produced. The length of the target captured by the image depends on the rate at which the scanner is moved during the scan, and the duration of time the scanner beam remains turned on. A recommended rate of scanning is to move the scanner steadily across six inches (15 centimeters) of the scan path per second of time. The maximum scan time is 30 seconds. This gives a maximum scan image that covers 15 feet (4.5 meters) of linear travel.

The width of the area scanned corresponds roughly to the width of the MINI Z housing, approximately eight inches (20 centimeters). The width is indicated by the separation of the two laser guide beams. If the scanner is farther from the target, the width of the target scanned increases in proportion.

The scanned image is a composite of the backscatter of multiple individual bursts of the X-ray beam cutting across the horizontal plane of the scanner face, between the two laser guide beams. The distance between each scan, and the relative resolution of the image, is a function of the scan rate at the time of detection. The individual detection bands are joined to form a continuous image when processed by the MINI Z system.

7.5.2 Image Groups

Image scans are assigned to image groups. Image groups are useful to keep a series of scan images together for ease of tracking, and to allow descriptive comments for the group. There is no limit on the quantity of groups that can be maintained on the tablet, up to the storage limits of the tablet.

There are two types of image groups:

- Standard group – Contains individual scans. Create scans individually as required, and each new scan is added into the group, until a new group is created or a different current image group is reopened. There is no limit to the quantity of images that can be contained in a single standard image group. Scans are separately exported, searched, and commented.
- Multiple Images group – Contains up to 4 scans. Scanned images can be resized manually to present a uniform, sequenced, proportional appearance matching the scans together. Scans are enhanced, exported, searched, and commented together. (For information on working with Multiple Images groups, refer to Section 7.2, Multiple Image Scanning (Manual Stitching).)

7.5.2.1 Group Names

Image groups can be named by the user. When an image group is created (in the Scan Monitor Mode Screen) a default group name appears ("**Images**," see Figure 7-8). Tapping the Add Group button + opens a subscreen, with the hint text **Group Name** in a text entry box. The user taps inside the box to enable the on-screen keyboard, and types the name for the new group. The group name is committed to the database when the user taps the **OK** button.

- The group name cannot be modified after the group is created.
- The software automatically adds a blank space and a numeral (1, 2, …) to the typed text. If the user taps the **OK** button without entering any text, the software simply inserts the numeral to create the unique group name. (For the first group created on a calendar day, the default name, ***Images***, is used.)
- As the user types the new group name, the software attempts to match the characters to other group names of that type (standard or Multiple Images), created earlier on that tablet, on that calendar day. If a match is found, the software auto-fills the rest of the name and automatically adds a blank space and assigns a numeral (1, 2, …). The numeral is the lowest number not currently assigned to any group of that type (standard or Multiple Images), created on that tablet, on that calendar day.

  This type-ahead feature allows rapid entry of common group category terms; for example, "Car search 1…," "Car search 2…." If a matching entry is not wanted, it is automatically dismissed when the user enters a character that does not match.
- Note that the numeral is intended only to uniquely identify group names of that type (standard or Multiple Images), created on that tablet, on that calendar day. It is not intended as a sequencing number. For example, if a group is deleted, the numeral previously assigned to the deleted group becomes available to be reassigned to a new group.
- The roster of available numerals is reset for each calendar day (see Section 9.1, Daily Gallery Refresh).

- The rosters of available numerals for standard image groups is maintained separately from the roster for Multiple Images groups.

7.5.2.2 Creating and Editing Group Contents

To create a new image group, perform the following steps (see Figure 7-8):

1. In the Home Screen, tap the **Scan** button  . The Scan Monitor Mode Screen opens. (If the Scan Gallery Mode Screen opens, continue with the next step; the screen will automatically change to the Scan Monitor Mode Screen when scanning begins.)
2. Near the top of the Content pane, tap the Add Group button +. The **Group Name** text entry box opens.
3. Tap inside the box to enable the on-screen keyboard, and type the name for the new group. The group name cannot be modified after the group is created.
4. Select the type of group using the **Multiple Images** slider button ||||:
   - Multiple Images groups is not selected by default
   - To create a Standard image group, tap the control, until the label changes to "**Off**."
   - To change back to creating Multiple Images groups, tap the control, until the label changes to "**On**."
   - Alternatively, to toggle between Standard and Multiple Images groups, tap the slider repeatedly.
5. Tap the **OK** button to save the name and close the box; the group name appears in the current scan group name field.

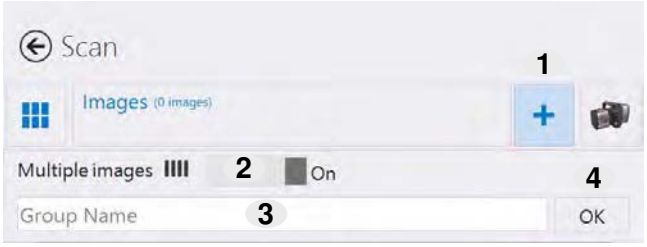


Figure 7-8: Scan Group Creation. (1) Add Group button, (2) Set Standard/Multiple Images type selection slider, (3) Type in Group Name text entry box, and (4) click OK button.

It is possible to reopen and add images to a standard scan group previously created during the current calendar day. To do so, in the Scan Gallery Mode Screen, tap a thumbnail of a scan already in the target

group. The thumbnail should be highlighted. Create scans using normal procedures. The new scans are automatically added to the group of the selected thumbnail image.

For information on reopening and adding to Multiple Images groups, see Section 7.2, Multiple Image Scanning (Manual Stitching).

7.5.3 Adding Comments to Scan Images

Scan images are automatically date and time stamped as they are created and assigned a unique image number for identification (see Section 9.3). This ensures that the sequence can be properly understood during analysis. That image identification information cannot be changed after a image has been created, however comments can be added to individual images. Comments can be modified after they are created. Comments are included in searches when the text criterion is used.

A comment added to any image in a Multiple Images group is automatically added to all images in that group.

To add a comment to an image:

1. In the Scan Monitor Mode Screen or the Review View Mode Screen, display the individual image of interest.
2. Referring to Figure 7-9, at the top of the image area, tap the Current Group Name box. A text entry box opens.
3. Tap inside the text entry box and use the on-screen keyboard to enter comments.
4. Tap the **OK** button to save the comments. The comments appear in the header in both the Review View Mode Screen and Scan Monitor Mode Screen, and also in the gallery view in the Review and Delete Search Mode Screen.

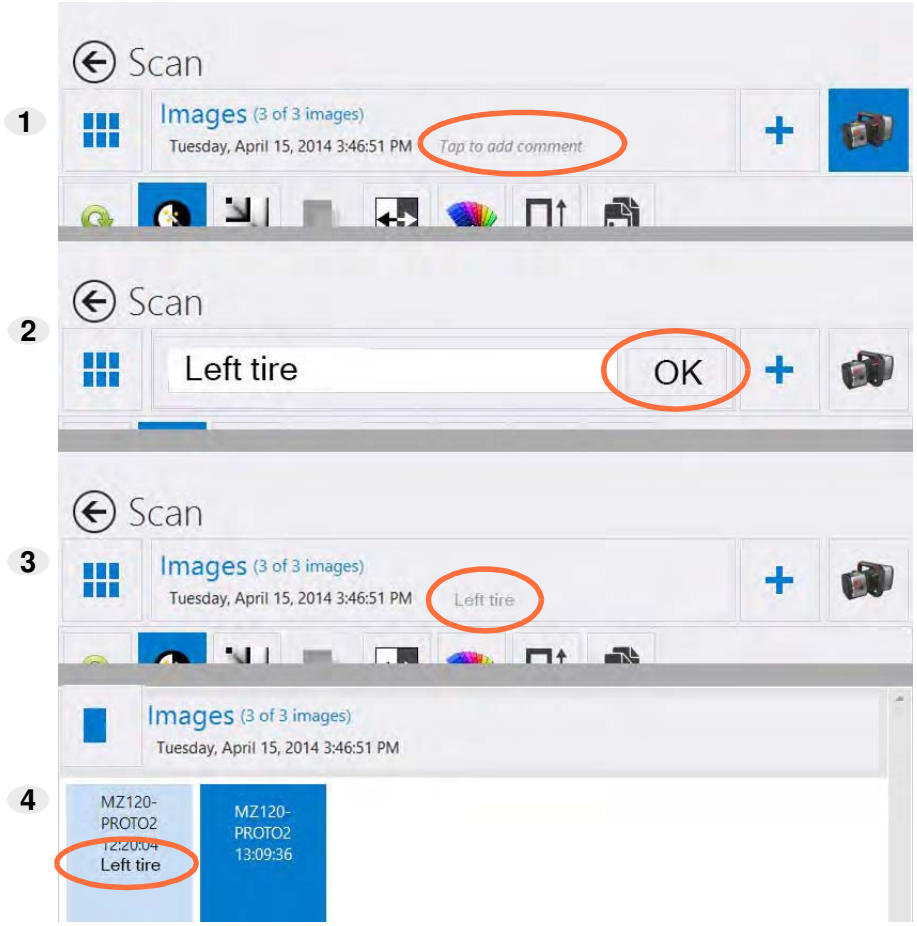


Figure 7-9: Review View (single scan) mode screen comments controls (comments controls for the Scan Monitor mode screen are similar). (1) Current Group Name with text link prompt to add a comment, (2) Tap to open text entry box, tap **OK** button to save comment. (3) Comment appears in screen header in Review (single scan) mode. (4) Comment appears in image header in gallery (multiple view/delete) mode.

7.5.4 Flags for Scan Images

While an image is viewed in the Scan Monitor Mode Screen or the Review View Mode Screen, the user can tap the Flag button in the upper corner of the Content pane. This is a very quick context-ready step that marks the image for easy selection in any of the Search Criteria screen applications (see Section 9.4.2, Using Search Criteria). Flagging also makes it necessary for the user to specifically enable deletion of flagged images (see Section 9.11, Deleting Images).

A flag added to a Multiple Images group is automatically added to all images in that group.

- By default, images are not flagged, and the Flag button appears dark gray . When selected, the Flag button appears red .
- In the selection screens, such as for Review Search mode, Scan Gallery mode, Backup, Restore, and Export, if the image is flagged, a red Flag icon appears at the top corner of the image thumbnail (see Figure 9-4). If the image has not been flagged, the Flag icon does not appear.
- To change the flagged state of the image, open the image in the Review View Mode Screen (or the Scan Monitor Mode Screen if currently scanning the image group), and tap the Flag button in the Content pane.

7.6 Faults and Warnings

The tablet displays information for faults and warnings that occur in either the scanner or the tablet. The following information is available:

- The Status bar at the bottom of the tablet screens displays the Fault icon and the Warning icon when those states are present.
- The Status Overview mode screen (see Figure 5-9) has the **Faults** and **Warnings** sections that display messages for various faults and warnings encountered by the MINI Z system. When no fault is detected or warning issued, these sections are not displayed. The error messages are described in Table A-4.
- In addition, when a fault is detected or a warning issued, an alert message box describing the problem appears for 8 seconds of time at the bottom of the touchscreen.

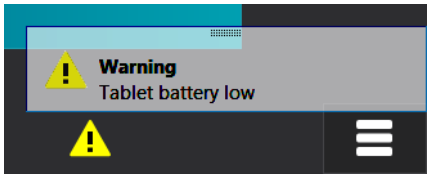


Figure 7-10: Warning or fault notification box appears in the touchscreen when an event occurs.

Fault conditions and warnings are handled differently by the system:

- **Faults** – Faults are generated only for unrecoverable scanner problems. When a fault is detected, the system immediately aborts any operation in progress and transitions to Fault mode, in which the scanner X-ray generation circuits are immediately turned off, and the Status LED on the scanner housing turns red (see Table 4-2).

There is no way to exit Fault mode except by turning off the key on the scanner housing. The scanner can be turned on again, and initialization tests are performed. If the fault clears, scanning can begin again. If the fault is still present, the scanner enters Fault mode again, and AS&E should be contacted.

- **Warnings** – The system continues to operate when certain errors or impending error conditions are detected, and a warning message is displayed. If the condition is resolved, or the process involved ends, the warning message is removed. Further information on warning conditions can often be found on the Status Details mode screen (see Figure 5-10).

7.6.1 ScannerUser and Admin Login Accounts

When the tablet is turned on in normal operation mode, the **ScannerUser** login screen appears for about one second of time, before ASEInspection login or Home screens appear. Also, when the tablet is awakened from Sleep mode, it opens to the **ScannerUser** login screen. This section describes this and the related **Admin** account.

The ***ScannerUser*** user account and the ***Admin*** user account are Windows operating system accounts; the kind of accounts used to login to any computer using the Windows operating system. After logging into Windows using one of those accounts, an operator can log into ASEInspection, as for any software application program (Figure 7-11). To login to ASEInspection a separate ASEInspection user account and password is required.

ScannerUser is specially programmed to automatically open ASEInspection as soon as the ScannerUser account is opened. In addition, ScannerUser is programmed to automatically close Windows and shutdown the tablet as soon as the **Exit** button closes ASEInspection. ScannerUser is the default user account, and does not require a password to be opened. Password security is applied to opening ASEInspection and there is no access to the Windows operating system allowed for ScannerUser.

Admin is a Windows supervisor account, one that is used to reset Windows operating system settings. Admin requires a password to open. To access Admin, the user must log out from ScannerUser and then enter Admin (Section 3.7.1), and to reenter ScannerUser, the user must log out from Admin and then reenter ScannerUser, or restart the tablet (Section 3.7.2).

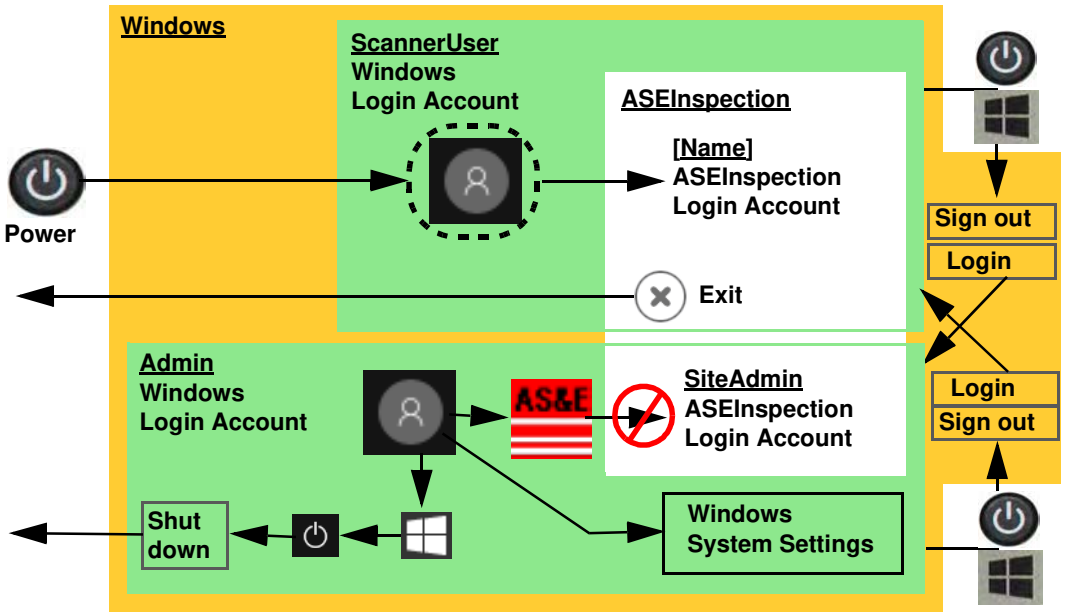


Figure 7-11: Windows User Accounts Typical Usage. Accessing **ASEInspection** from the **Admin** account is not recommended for users; this access point is intended for service maintenance use only.

7.6.2 Troubleshooting Windows Login Accounts

When Windows is opened from being powered-off, it automatically opens in the ScannerUser Windows login account without a password, so the ScannerUser login screen appears for about 1 second of time, and then ASEInspection is automatically opened.

If Windows enters Sleep mode with ScannerUser active, when the user awakens Windows, the ScannerUser login screen opens and remains open, so the operator is required to tap the **Sign in** button to open ScannerUser (and automatically return to ASEInspection, at the same screen where it entered Sleep mode).

When the tablet awakens from Sleep mode while in the **ScannerUser** account is still active, the tablet may open **ScannerUser** and ASEInspection without login.

To protect against improper access to ASEInspection, the user must shut down the tablet when it is not in use.

Admin is opened by accessing the Windows operating system (Section 3.7.1), then logging out of the ScannerUser account, and finally logging into the Admin account. Although ASEInspection can be opened from the Admin user account (by double tapping the ASEInspection shortcut button AS&E), this version of ASEInspection is intended only for service maintenance. The screen settings under the

Admin account can be different from those applied under the ScannerUser account, and some functions are disabled. It is not recommended to use ASEInspection from the Admin account.

If the ASEInspection screen has changed characteristics, such as display language, check if the tablet is in the Admin account. To do so, on the frame of the screen, tap the Windows Start button  . If the Start menu opens, the tablet is in the Admin account.

If Windows enters Sleep mode with Admin active, when the user awakens Windows, the Admin account opens without a login screen, to the same screen (ASEInspection or other) where it entered Sleep mode.

When the tablet awakens from Sleep mode while in the **Admin** account is still active, the tablet can open ASEInspection without login.

To protect against operator access to the operating system, after completing configuration tasks, the supervisor user must either logout from the Windows **Admin** user account and login to **ScannerUser,**.or power-down the tablet.

Chapter 8

Image Review

This chapter describes features in the AS&E® MINI Z™ ASEInspection™ Software for searching for scanned images, selecting and viewing images, and image enhancement. The functions described in this chapter can be performed using the tablet. The tablet does not have to be connected to a scanner.

For information on image backup and restore, see Chapter 9, Image Management. For information on capturing new images, see Chapter 7, Advanced Scanning.

8.1 Viewing and Enhancing Images

Detailed viewing and enhancing of current images can be performed in the **Scan** screen. Viewing and enhancing of images restored from the tablet onboard database are performed in the **Review** screen. Images, image groups, multi-scan image groups, and Reference images can be searched and retrieved using search criteria (see Section 9.4, Searching for Images), and then displayed and enhanced, and shared (see Section 9.6, Exporting Images) as required.

Reference images are simply scanned images that have been stored in a specialized archive to facilitate retrieval and sharing. For additional information, see Section 9.8, Reference Images.

To open the Review screens:

1. Open the ASEInspection Software to the Home Screen (in primary screens tap the Back button ).
2. Tap the **Review** button. The screen displays either the Review View Mode Screen or Review and Delete Search Mode Screen.

   These are two modes of the Review screens, each optimized for specific tasks. Toggle between these two modes by tapping the Mode button, which changes appearance to indicate the mode:

 indicates the Search mode is active, tap to open the Review View Mode Screen to view a single scan full screen

 indicates the View mode is active, tap to open the Review and Delete Search Mode Screen and view a gallery of scans in individual groups

8.1.1 Using Review View Mode

Use this screen mode to examine individual scanned images and Reference images. Tools are available to apply image enhancements to isolate and interpret image elements.

- Individual images and groups can be located by using the Review screen in Search mode (see Section 5.5, Review and Delete Search Mode Screen). Double-tap an image thumbnail to view it in View mode.
- In View mode, the Flag icon is available in the Content pane. Tap to mark the image for easy selection using search criteria. See Section 7.5.4, Flags for Scan Images.
- All of the other images in the group are available for individual viewing in View mode, without having to switch back to Search mode. To see each image in sequence, tap the Previous button and Next button (see Figure 8-1), located on the left and right sides of the Content pane.
- The Enhancement Tools menu appears at the top of the Content pane (see Figure 8-1). Enhancements are described in Section 8.1.2, Enhancements Toolbar.
- The common touchscreen gestures described in Section 3.4.5, Hand Gestures are available in the Content pane, as well as the following additional gestures, for manipulating images:
  - Double-tap to zoom in (approximately 3X enlargement), centered at the point of tap. The first double-tap displays the image so it fills the width of the Content pane. The second double-tap zooms in 3X from full width. Subsequent double-taps will toggle between the two zoom levels.
  - To display the entire image, perform a two-finger tap.
  - Pressing and dragging a scan causes the scan to pan (move the image, or scroll the view) in the screen.
  - To interactively modify density of the image, start as if to pan the image, pressing one finger, but then tap with a second finger to lock the position of the image. See Section 8.1.4, Interactive Brightness and Contrast.

8.1.2 Enhancements Toolbar

The image enhancement tools are available from a menu that appears in the Scan Monitor mode screen (see Figure 5-2) and the Review View mode screen (see Figure 5-4). When enhancements are applied to any image, the enhancements continue to be applied to every other image viewed, until the enhancements are manually changed or the tablet is turned off. In this manner, the user can quickly compare the various scans against the same conditions.

The Enhancement Tools menu is shown in Figure 8-1. The individual enhancements are described in Table 8-1.

- To apply an enhancement, tap the corresponding tool button. The enhancement is applied when the button has a blue background  . It is not applied when the button has a default background  .

- To remove an enhancement, tap the tool button again. To remove all enhancements, tap the Reset  button.
- Multiple enhancements can be applied at the same time. To do so, tap the various tool buttons on or off. For example, a color spectrum might be further enhanced by a contrast effect. Tap the Color Palette tool and then the Adaptive Contrast tool. Then, press and tap to fine-tune the effect interactively.

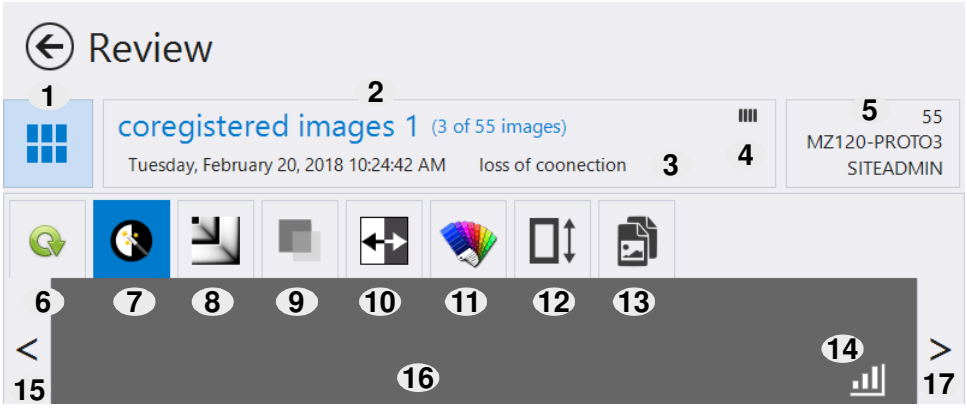


Figure 8-1: Enhancement Tool Menu Layout (Identical layout for **Scan** screen and **Review** screen). The buttons are described in Table 8-1.

Table 8-1: Review View and Scan Monitor Modes Enhancement Tools Menu Description

Key	Name	Description
1	Mode button 	With this marking, indicates View mode of Review screen (or Monitor mode of Scan screen) is displayed, and the Enhancement Tools menu is available. If the alternate Mode button icon  is displayed, tap the button to update the screen.
2	Current Image Group Name and identification display	Displays the name of the image group being shown, the sequence number of the currently displayed image within that group, and the creation date and time range of the group.
3	User Comment	Tap to open an on-screen keyboard to enter information about the currently displayed scanned image (not available for Multiple Images groups). These comments appear also in the Monitor and Gallery modes of the Scan screen and the Search mode of the Review screen.
4	Multiple Image Group 	Appears when the current group is a Multiple Images group.

Table 8-1: Review View and Scan Monitor Modes Enhancement Tools Menu Description (continued)

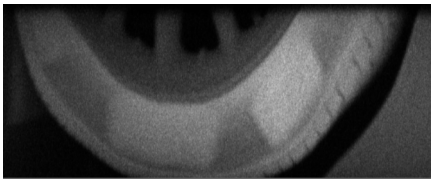
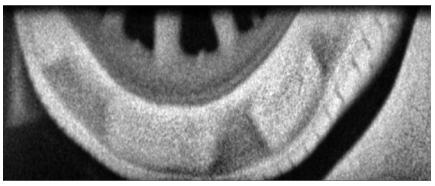
Key	Name	Description
5	Image Identification Data	• Image Number – Consecutive number assigned by each tablet to images recorded from scanners • Scanner Serial Number – Serial number of the scanner that generated the image • User Name – User name of the login account that recorded the image
6	Reset 	Tap to cancel all image enhancements and restore the image to the original appearance (including the removal of the Dynamic Contrast enhancement, applied by default).Multiple Images group changes to alignments and proportions cannot be reset in the screen, but original image appearance is available in exported FULL files 
7	Dynamic Contrast 	Enabled by default when system turned on and at the start of every individual scan. If disabled manually, it remains off until the next new scan, unless reenabled manually. Equalizes the color tonal range (density appearance) between full white and full black for the currently visible area of the image. The equalization updates automatically as the view is changed by zooming or panning, always matching the range of color tones. Manual adjustment of density appearance (by using the press and tap gesture) is automatically done, or can be done by turning off this enhancement (tap until the highlight is removed from the button).To extend this effect to more extreme lighter or darker ranges, repeat the press and tap gesture multiple times. See Section 8.1.4, Interactive Brightness and Contrast. Turning off this enhancement disables only the automatic updating feature, and does not remove the current equalization in effect, so the current equalization is now applied to the entire image. (To remove the tone equalization effect entirely, tap the Reset  button.)
8	Adaptive Contrast 	Tap to maximize contrast among different objects. 

Table 8-1: Review View and Scan Monitor Modes Enhancement Tools Menu Description (continued)

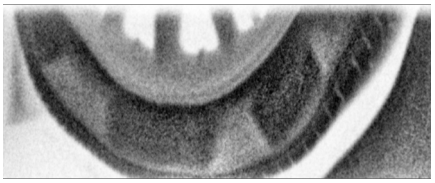
Key	Name	Description
9		Future feature placeholder
10	Reverse Video 	Tap to reverse tones: in grayscale darker areas become lighter, and lighter areas become darker. This can be of particular assistance when viewing the image in changing ambient light conditions. In color modes, applied colors are replaced with their opposites. 

Table 8-1: Review View and Scan Monitor Modes Enhancement Tools Menu Description (continued)

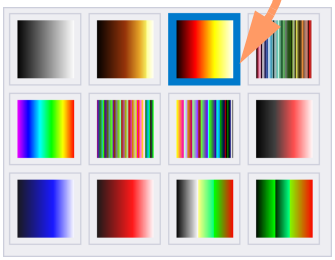
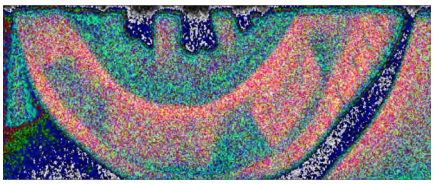
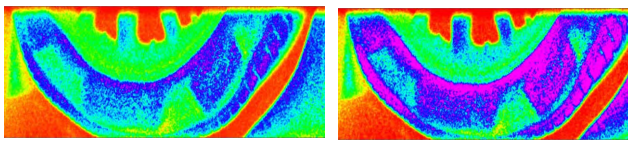
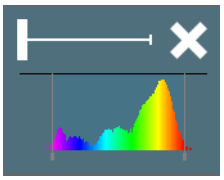
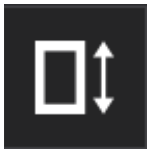
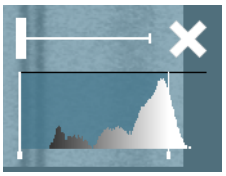
Key	Name	Description
11	Color Palettes (Button)  (Available Palettes) 	Tap the button to access the selections. Tap a palette to apply to the current image. Using a color palette may be better for identifying material and determining areas of interest. Using the grayscale may be better for distinguishing object shapes. Use a color palette with many colors to bring out higher resolution details, as shown below:  The range of the palette can be changed interactively by using the press and tap gesture. This changes the color contrast (density), allowing optimum enhancement of individual features of interest. The two figures below have the same palette applied, but with different densities set using the press and tap gesture.  To extend this effect to lighter or darker ranges, repeat the press and tap gesture multiple times. The Histogram feature can be used to identify the relative densities of the assigned colors. See Section 8.1.5, Histograms. High Density  Low Density

Table 8-1: Review View and Scan Monitor Modes Enhancement Tools Menu Description (continued)

Key	Name	Description
12	Aspect Ratio 	Tap to lock the image width at the current value. Allows vertical elongation and contraction of the image within the screen section to study detail and perceive natural profiles. Tap again to return the image to the default (zooming proportionally in both width and height). With Multiple Images groups, applies to all images, but each image can be individually adjusted. (See Section 7.3, Aspect Ratio Control)
13	Export 	Tap to save the images, in JPEG or PNG format, to a connected storage device. The visible area with enhancements is saved. For Multiple Images groups, the entire group is presented as the visible area and each separate image is entire. Any enhancements applied at the time of export are included in all files. Creates an Images/ folder on the storage device. See Section 9.6, Exporting Images.
14	Histogram 	Tap to open a utility that allows graphic manipulation of the brightness and contrast of the view area using a histogram. See Section 8.1.5, Histograms 
15	Previous Image	Tap to view the previous scanned image in the available images.
16	Content Pane	Displays scanned images at full screen resolution.
17	Next Image	Tap to view the next scanned image in the available images.

8.1.3 Dynamic Contrast

By default, images are enhanced with the Dynamic Contrast function, an automatic feature that optimizes image quality by continuously updating image contrast and brightness (density) according to what is currently visible in the Content pane in Scan Monitor mode or Review View mode. The ASEInspection Software samples the tone value of the pixels in the current view and maps them across the full color tone range. This results in the middle ranges being assigned more of the spectrum, allowing the user to distinguish more details in tone variations. The effect is constantly applied, automatically updating according to the view, as the view is zoomed or panned. (This can result in the image shifting darker or lighter, which is normal as it compensates for extremely light or dark areas that come into the current view.)

Dynamic Contrast is enabled or disabled using the Dynamic Contrast button  on the Enhancements Toolbar (see Section 8.1.2, Enhancements Toolbar). The button is highlighted by default, indicating that the function is initially enabled. In addition, if the function is manually disabled, it is

automatically enabled again at the start of every new scan. This provides an optimal image updating while the view is changing.

Disabling Dynamic Contrast only disables the automatic function, setting the overall contrast at the last level. Contrast can then be applied manually, as described in Section 8.1.4, Interactive Brightness and Contrast.

Zoom and scroll can be used with Dynamic Contrast to move very bright or very dark sections out of the view, with the result of adding definition to the medium areas, to closely examine particular areas of interest. The Dynamic Contrast effect can be completed removed by tapping the Reset button  . Examples are provided in Figure 8-2.

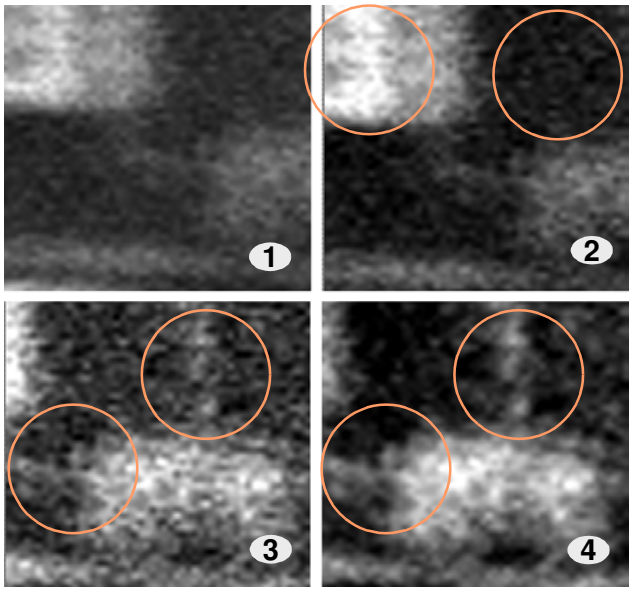


Figure 8-2: Example of Image Manipulation with Dynamic Contrast. (1) Without Dynamic Contrast (example after tapping the Reset button), the tonal range is set by the entire scanned image. (2) With Dynamic Contrast, the color tonal range for the view area is maximized from white to black. (3) Automatic update after shifting bright area out of view area maximizes the range for the mid-tones, revealing details. (4) After tapping the Dynamic Range button (removing button highlight), apply manual contrast (density) fine-tuning by using the press and tap gesture to optimize image details.

8.1.4 Interactive Brightness and Contrast

When Dynamic Contrast is stopped, the software allows manual interactive simultaneous adjustment of brightness and contrast. Although these adjustments apply to the entire image, the user can optimize contrast for any particular feature in the image, not just for the average of all the features in the view (as does Dynamic Contrast). With multi-image groups, the user can independently adjust each image so the entire set has a consistent appearance.

To turn off Dynamic Contrast, either:

• Tap the Dynamic Contrast button in the Enhancements toolbar, or

• Press-tap-drag in the scan image. The direction of drag determines the relative change in brightness and contrast. Press, tap, and drag is a standard Windows touchscreen technique:

1. Start as if to pan (scroll) the image, pressing and holding one finger on the touchscreen.
2. Without moving that finger, tap with another finger, as if drumming your fingers on a table.
3. After that second tap, drag your finger. The second tap tells the tablet not to move the image, but instead change the image appearance.

The whole movement is illustrated in Figure 8-3.

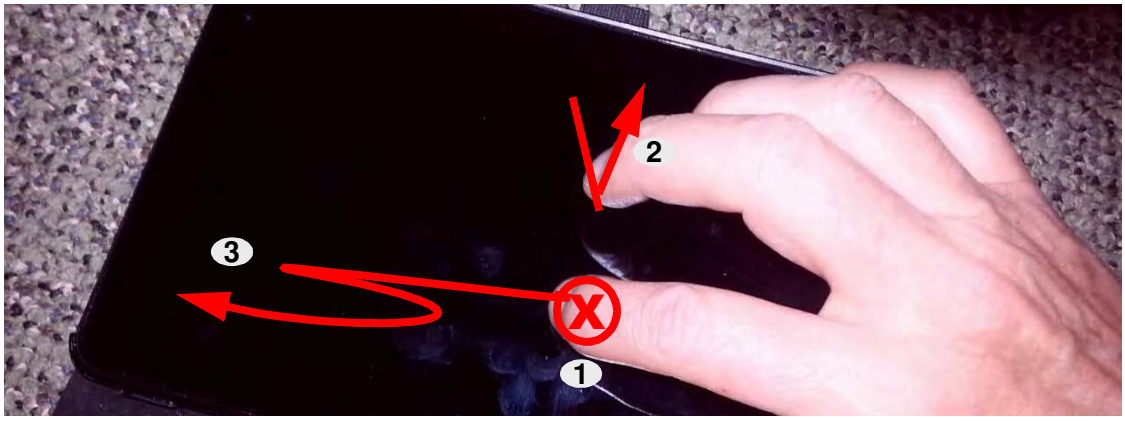


Figure 8-3: (1) Press, (2), tap, and (3) drag gesture. The effect is shown in Figure 8-4.

The direction of drag sets the contrast and brightness levels, as illustrated in Figure 8-4.

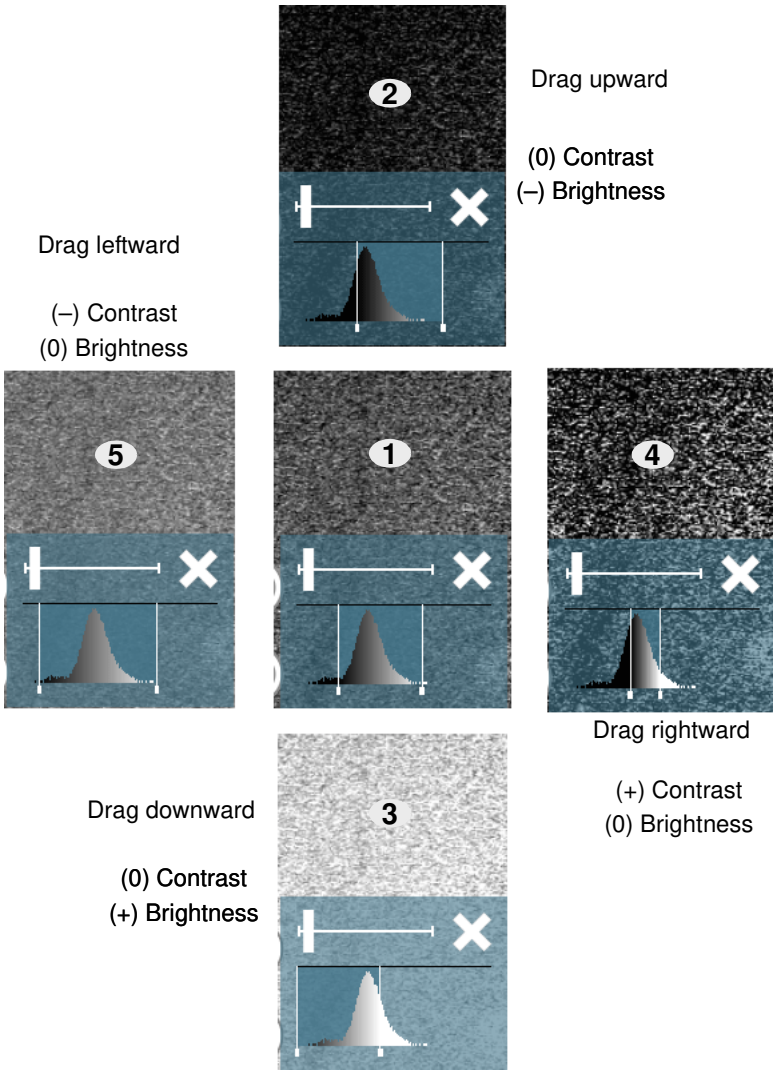


Figure 8-4: The contrast and brightness effect of the press-tap-drag gesture in Figure 8-3. Each motion starts from (1) Dynamic Contrast default, (2) Finger drag up screen, (3) Finger drag down screen, (4) Finger drag right screen, and (5) Finger drag left screen.

8.1.5 Histograms

The histogram maps the tone of every pixel in the view, and provides a systematic method for setting and analyzing changes. The features are:

- The left vertical line is the Black Point, all pixels darker than that are colored black
- The right vertical line is the White Point, all pixels lighter than that are colored white.

- All points between the Black Point and the White Point are evenly distributed across the 256 shades of gray.

When the Black Point and the White Point are close together there is high contrast with many gray values for small changes in gray objects.When the Black Point and the White Point are far apart, there is low contrast with few gray values covering larger changes in gray objects.

When the range between the Black Point and the White Point is shifted to the darker side, there is more contrast in the darker grays, and the lighter grays are indistinguishable. When the range between the Black Point and the White Point is shifted to the lighter side, there is more contrast in the lighter grays, and the darker grays are indistinguishable.

Dynamic Contrast sets the position and range of the Black Point and the White Point. When Dynamic Contrast is active, the vertical lines at the Black Point and the White Point change from white to gray, to signify they are not longer manual.

The bar in the histogram is a tool for immediately shifting contrast from the default medium range to a higher level with a smaller range.

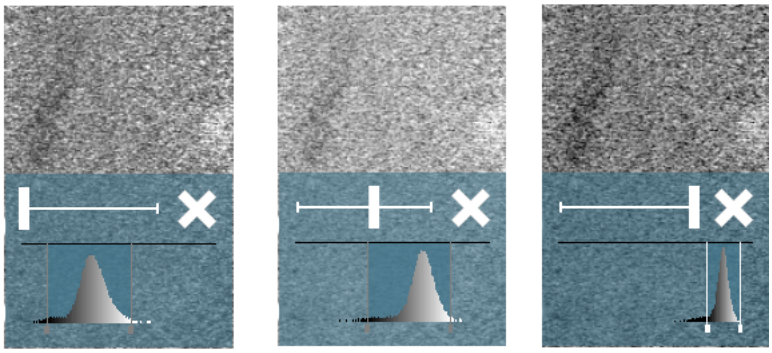
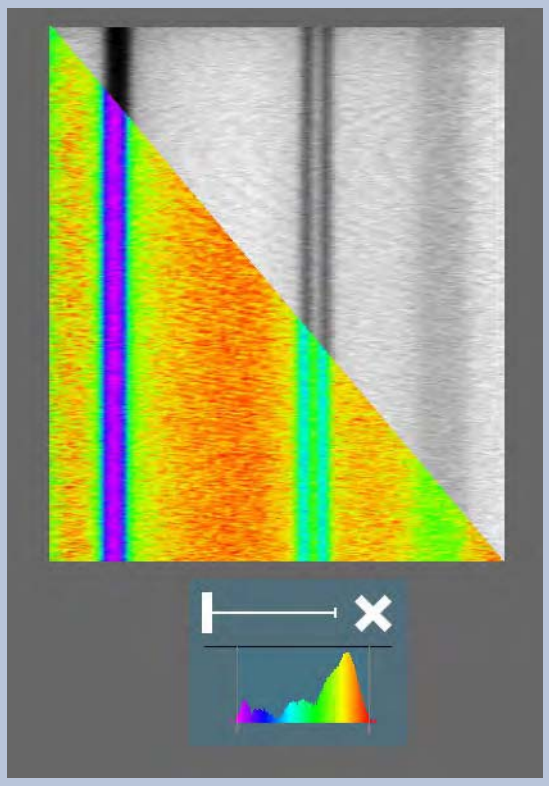


Figure 8-5: Standard Shifts Using the Histogram Bar.

The Histogram button appears in the scan image.  Click to open the histogram.

To close the Histogram, tap the “X” (circled at right)

Histograms can be useful when interpreting densities when using the Color enhancement (Section 8.1.2, Enhancements Toolbar). In the example below, the brighter purple tone is shown to indicate a higher density than the darker blue tone. Both densities appear dark in the grayscale tone range. Green appears dark in the grayscale, although it is a mid-range density.



Chapter

9

Image Management

This chapter describes procedures for maintaining images created in the MINI Z™ system. Scan images are automatically saved to the tablet database. The ASEInspection™ Software Backup feature archives individual scanned images, grouped scanned images, and Reference images. Image metadata (group names, date taken, user comments, and image numbers) are preserved.

When images are backed up, there are two options:

- The Tablet library. This is for images that may be restored to the same tablet in the future.
- The Reference library. This is for images that are intended to be shared among tablets.

9.1 Daily Gallery Refresh

On a daily basis, the Gallery screen and group name unique identification numbers are reset. Reset occurs at the first scan created on the next calendar day (the first new scan after midnight on the tablet).

- The Scan Gallery Mode Screen is cleared daily at reset. During a calendar day, the scans created on that day are displayed in the screen for ease of reference. Those remain on display until reset occurs. After the daily scans are cleared, the scans from previous days can be displayed by using the Review and Delete Search Mode Screen.
- To protect against repeating any group name, when a group name is repeated, the software automatically makes the newer group name unique by adding a space and the lowest unused number (see Section 7.5.2.1, Group Names). Separate rosters of numbers are maintained for normal Images groups and for Multiple Images groups. All rosters are cleared at reset.

9.2 Managing Storage Space on the Tablet

The supplied tablet is equipped with the following storage features:

- Internal solid state hard drive (SSD)
- Removable storage device ports (for location, see Figure 4-3):
  - USB-A port: easily accessible for a user-supplied external storage device, such as a USB thumb drive
  - microSIM or microSD storage device port, accessible through the Main Battery bay

The system issues a warning when there is less than 5% of unallocated internal SSD storage space available. When this happens, the user immediately should either delete unwanted images, or backup and delete images.

CAUTION

If the storage on the tablet is completely consumed, the system will not work properly.

To check the level of hard drive usage on the tablet, perform the following steps:

1. On any screen, in the lower corner, the Status button appears . Tap the button to open the Status screens.
2. In the top corner, tap the **Details** button (see Figure 5-10). In the **Tablet** table, in the **Available free space** row, the amount of free space is shown.

9.3 Sharing External Images

The ASEInspection software supports several operations that allow backup and memory management as well as distribution of images for use in reporting and in other software applications (see Figure 9-1):

- Image Management
  - Backup – Archive (copy or move) scan images and groups, and Reference images (see Section 9.9, Backup of Images)
  - Restore – Reload (copy) images and groups, and Reference images, that had been previously backed-up (see Section 9.10, Restoring Images)
  - Delete – Permanently delete images from the tablet (see Section 9.11, Deleting Images)
- External reporting
  - Export – see Section 9.6, Exporting Images
    • From the Export Screen screen, copy one or more full images (without enhancements) to external data store in industry-standard graphics formats
    • From the Scan Monitor Mode Screen or Review View Mode Screen, copy the viewed area of an image (with enhancements) to external data store in industry-standard graphics formats
  - Create – Upload incident reports (see Section 11.9, Incident Reports)
- External file operations can transfer data via:
  - USB storage drive connected to the USB-A port
  - microSD or microSIM storage device loaded in the tablet memory card port

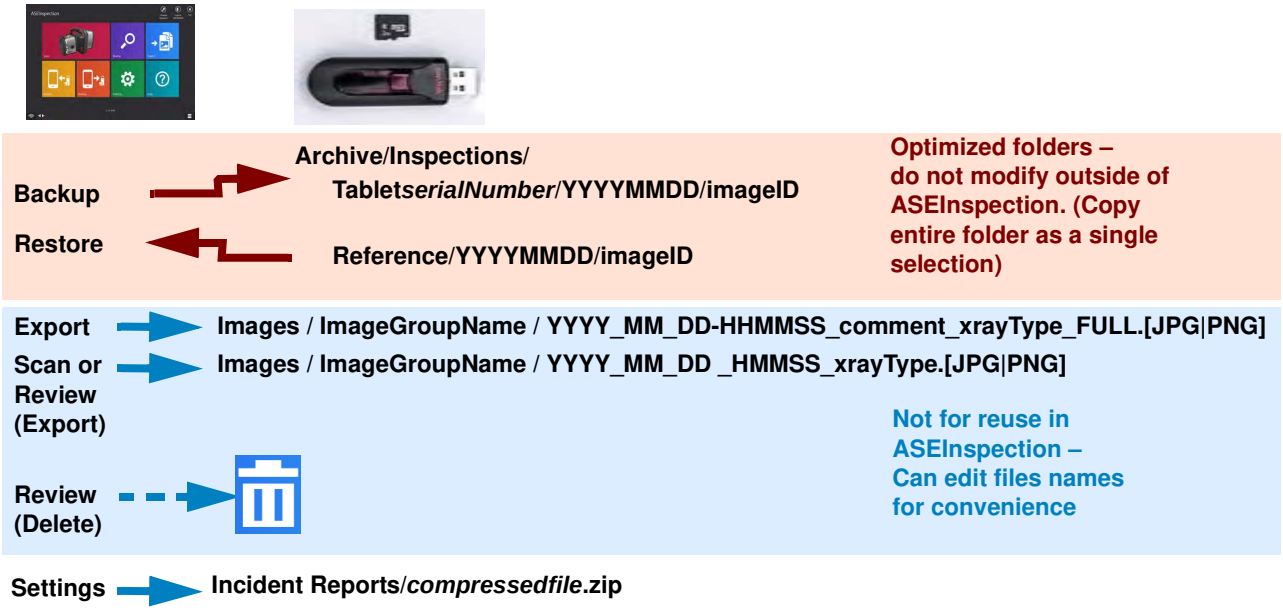


Figure 9-1: External Data and Images Operations Overview

9.4 Searching for Images

Use the Search screen mode of the Review screen to apply search criteria to find images, image groups, and Reference images already restored from previously backed-up images. Double-tapping an image thumbnail found in this screen automatically opens the image in the Review View mode of the Review screen, and the other available images can be viewed one-by-one.

In cases where an image group did not match search criteria, but individual images in the group did match the search criteria, only the matching images appear in the selection, under the header for the group. The images in the group that did not match the search criteria are not returned.

For Multiple Images groups, the criteria are applied only at the group level, and the entire group is returned.

Scanned images are automatically marked with the date and time they were created. Images are created in groups (see Section 7.5.2, Image Groups), which can be given names that can be used in searches. Searches can also be made using comments applied to images (not available for images in Multiple Images groups), the date the images were created, the login account of the recording user, and by marking as Flagged or as Reference images. Image numbers are not available for searching.

9.4.1 Image Numbers

Whenever a scan is taken, its image is assigned an image number that is the next consecutive number for the tablet that is connected to the scanner (regardless of the scanner that was used). If this image is backed up and restored to a different tablet, it will be assigned a new image number that is the next consecutive number for the tablet it is restored to. Whenever this image is backed up, however, it will always be stored on the external media under the library of the tablet that originally recorded the image, and will be shown with its original image number. The image number appears in the Review View Mode Screen. This number cannot be used as a search criterion.

9.4.2 Using Search Criteria

In the Search mode (Review) screen, open the selection criteria to enter or choose criteria to find images and groups of scanned images. It is shown in Figure 9-2.

To list all images currently in the tablet database, clear all criteria check boxes.

Multiple criteria can be entered. The software applies all criteria entered, so if any of the criteria match a image or group, the image or group is included in the results set. In addition, the search is insensitive to letter capitalization. For example, search on “EL” will return any images or groups with “el” or “EL” in the names. This provides the most liberal interpretation, in order to facilitate rapid image retrieval.

To use the search function, perform the following steps:

1. Open the Search mode of the Review screen by tapping the Mode button  until it appears marked with a single rectangle  .
2. At the top center of the Content pane, tap the Selection Criteria button. It appears as a wide box (see Figure 9-2), typically displaying the criteria used in the previous search. The search criteria list opens (Figure 9-2), used to enter terms for searching.
3. Enter or choose criteria. The individual selection criteria types are selected as follows:
   a. Tap the check box at the beginning of the criterion row. This enables the selection boxes or text fields in the row for defining filters.

For the **Flagged Images** and **Reference Images** criteria, there are no additional filters. All such images that are available in the source library are selected.

   b. Select or enter criteria values as necessary

4. When entries are complete, tap the Search button  . The list closes, the search is executed.

When the search ends, the result selected images are made available in the Content pane under collapsible group headers.

- Tap a group header to see thumbnails of all images in that group that match the search criteria.
- Double-tap any image thumbnail to display that image in the full resolution View mode screen.
- The other images in the groups are also available in the View mode screen, by tapping buttons on the left and right sides of the Content pane.

9.4.3 Search Criteria Subscreen

The search criteria subscreen appears in Figure 9-2. It allows the user to choose or enter search criteria to find previously scanned groups of images, and to select groups to display in the View screen, where they can be seen at full resolution and enhanced to aid in distinguishing details. This format is used in all functions that search for images.

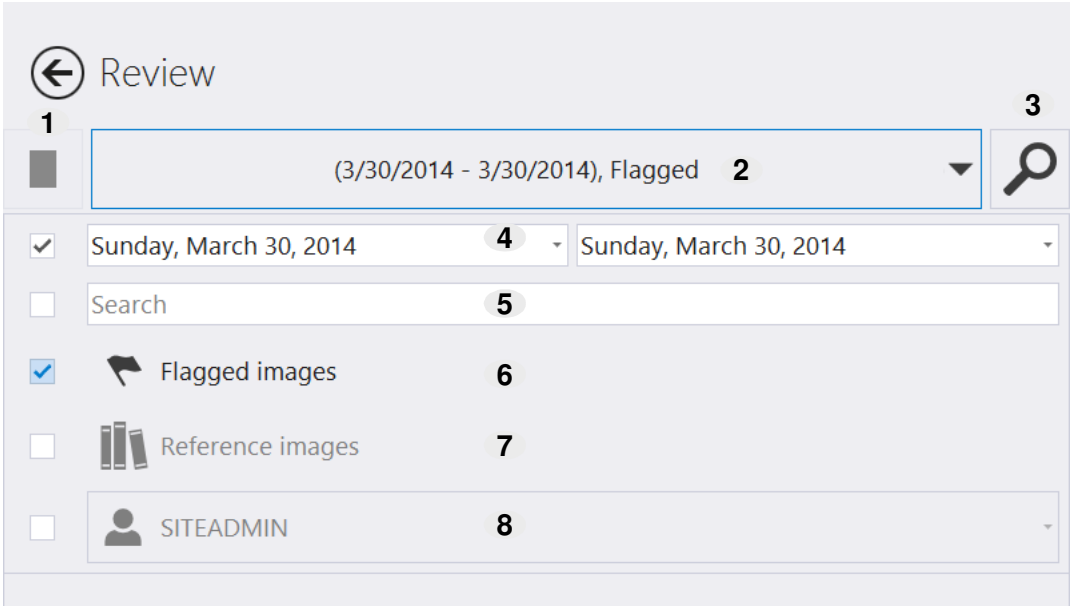


Figure 9-2: Search criteria list layout. The buttons are described in Table 9-1.

Table 9-1: Search Criteria Description

Key	Name	Description
	Related fields from primary screen	
1	Mode button 	Displayed in Review screen Search mode and Scan screen Gallery mode, indicates a search mode is active. (If the alternative appearance, with six blocks, appears, tap to change to this mode in order to perform a search.)

Table 9-1: Search Criteria Description (continued)

Key	Name	Description
2	Selection Criteria	Displays the criteria used to select the currently displayed images and image groups (it shows the criteria used in the last search). If the words **All Images** appear, that indicates that no filtering criteria are being used, so all images available are in the selection set. Tap to display the search criteria fields, used to enter filtering criteria for finding images.
3	Search button 	After entering search criteria in the search criteria list, tap to execute search for images.
	Fields	
4	From (Earliest) Date and To (Latest) Date	These two fields are both enabled by tapping the adjacent check box. To set a date range, enter an earliest date and a latest date, in either order in the two fields. Flick fields up or down to select the date (local time at image creation) (see Section 9.4.4, Date and Time Selection).
5	Search (text)	Enable this criterion by tapping the adjacent check box, then tap to open an on-screen keyboard to type the text to find, which can be all or part of image or image group names, or image comments.
6	Flagged	Enable this criterion by tapping the adjacent check box; selects all images that have been marked as flagged; not applicable to groups.
7	Reference images	Enable this criterion by tapping the adjacent check box; selects Reference images that have been restored to the tablet.
8	[User Account]	Enable this criterion by tapping the adjacent check box, then tap to open a list of user accounts used to record images in the source library. Tap to filter by the user account that recorded the image.

9.4.4 Date and Time Selection

For date and time selection in the search criteria list and the Incident Report screen, parameter selection menus with spinner controls are provided, similar to those shown in Figure 9-3.

- If both fields are for dates, the two dates can be entered in either order into the controls. The software always compares the dates and calculates the range.
- The values in the center row are used. Set each column separately, then tap the **OK** button to set the value for all columns in the menu.
- To traverse many numbers, flick the column spinner up or down.
- To traverse one number at a time, tap and drag the number into the center row.

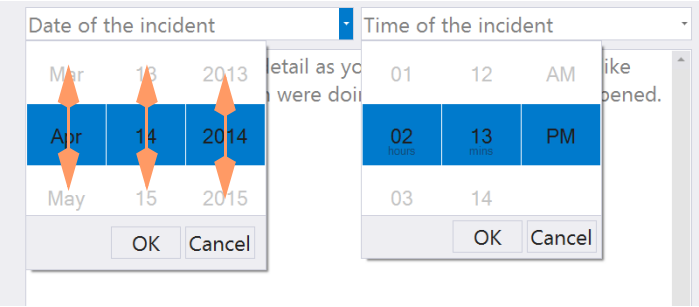


Figure 9-3: Typical spinners for date and time selection. For each column, flick the column up or down and then tap and drag to move individual values into the center row.

9.5 Selecting Images for Commands

For backup, restore, and deletion, images can be selected at three levels (see Figure 9-4):

- **Select All** check box – Located in the top of the Content pane. Tap the check box to select every image and image group returned by the search for the command action.
- Select all in group check boxes – Located in each header. Tap the check box to select every image in that group (select as many groups as required) for the command action.
- Select individual image check boxes – To view individual images, tap headers individually to display the gallery of images available in the group. Each image displays a check box at the top of the image. Tap the check box to select that image (select as many images as required) for the command action.

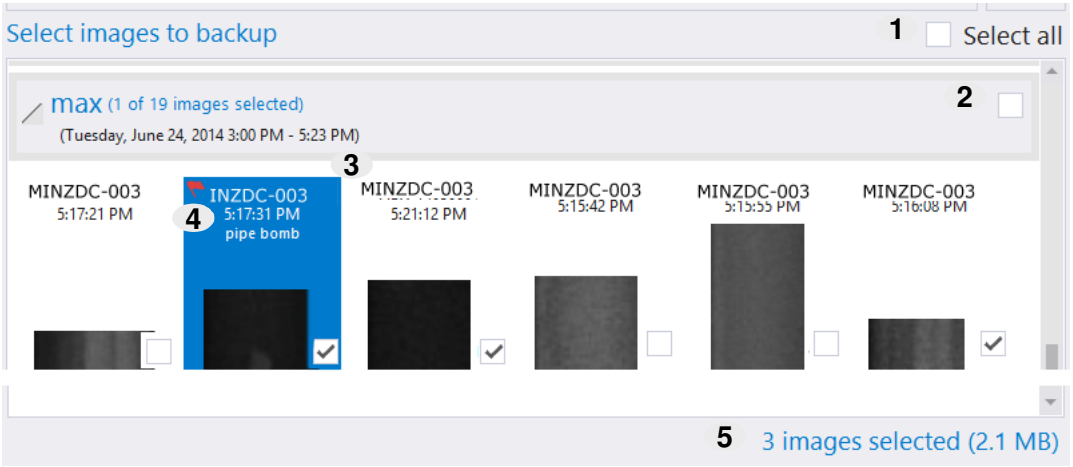


Figure 9-4: (1) Select All button, (2) Select All in Group button, and (3) Select Image button. (4) The red flag indicates the image is flagged, so an override acknowledgment is required from the user before this can be deleted. (5) Totals of selections.

In the image group headers in the Content pane, the total of images in the group and the quantity of images that matched the search criteria are shown. These values may not be the same, if individual images were matched by the search, rather than the group itself matching the search.

Different totals are shown at the bottom of the Content pane. These are the total quantity and size of the images that the user has currently selected for a command action.

9.6 Exporting Images

Individual scan images can be saved as JPEG (compressed) or PNG (lossless) files to an external storage device. The choice of the type of file can be set in the **Settings** : **General** screen, **Image Format** option group. The choice of format can be changed also in any of the screens that can perform the export: Export Screen, Scan Monitor Mode Screen (current scans) and Review View Mode Screen (restored scans).

9.6.1 Exporting a Single Image

Export from the Scan or Review screens creates one view area image file, with enhancements, in the selected format (JPEG or PNG), for the currently displayed image file. If the images are part of a multiple images group, all images are combined into one image, with the current view adjustments and enhancements. The files are stored in the top-level drive folder:

Images / ***ImageGroupName*** / ***YYYY_MM_DD-HHMMSS_xrayType***.[JPG|PNG].

Images are exported with the current enhancements applied. Images can be exported as many times as

required without affecting the original scanned image, so various enhancements can be applied and exported, or all enhancements can be removed by tapping the **Reset** button on the Enhancement Tools menu before exporting.

To export from the Scan or Review screen, perform the following steps (refer to Figure 9-5):

1. Mount the destination storage device (storage device such as a USB storage stick connected to the tablet USB-A port or to a microSD card insert in the tablet microSD slot).
2. On the Enhancements tool bar, tap the **Export** button . A subscreen opens.
3. Tap the list of available storage devices, then tap the target storage device.
4. Tap the file format selection.
5. In the subscreen, tap that **Export** button . The export proceeds. A notification appears below the subscreen.
6. To close the subscreen, on the Enhancements tool bar, tap the **Export** button , or tap the upward arrow button above the subscreen.

The destination folders and image file names are generated automatically, based on the image name of the original image and time of export.

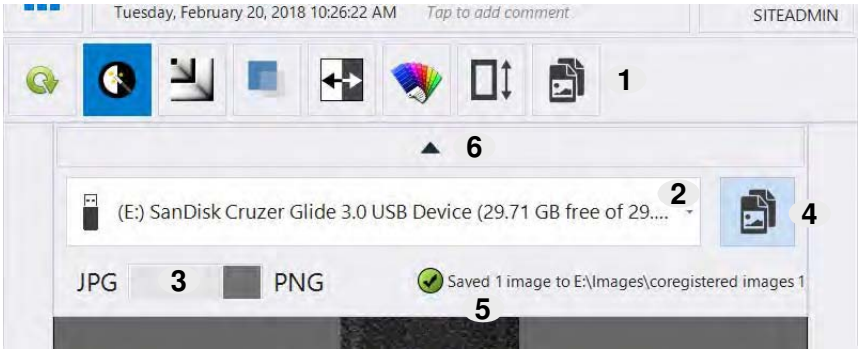


Figure 9-5: Scan Monitor mode or Review View mode screen (typical) after image export. (1) Export button to initiate export process (opens or closes the export sub-screen), (2) Destination data store, (3) Target file format selection, (4) Export button to create files, (5) Acknowledgment notification with destination folder path, and (6) Close export subscreen button.

9.6.2 Exporting Multiple Images

Export from the Export screen creates one full-image file in the selected format (JPEG or PNG) for each image file selected from the current scan image group (if there are multiple images, each one is exported separately). No enhancements are included. The files are stored in the top-level drive folder:

Images / ***ImageGroupName*** / ***YYYY_MM_DD-HHMMSS_comment_xrayType***_FULL.[JPG|PNG]

To export from the Export screen, perform the following steps (refer to Figure 9-5):

1. Mount the destination storage device (storage device such as a USB storage stick connected to the tablet USB-A port or to a microSD card insert in the tablet microSD slot).
2. At the top of the screen, tap the list of available storage devices, then tap the target storage device.
3. Search for the target images.
4. From the returned files, select the files to export:
   • Tap the check box for each file to export, or
   • Tap the check box in the image group header to include the entire group, or
   • Tap the check box **Select All** at the top of the Contents pane to export all files returned by the search query.
5. At the bottom of the screen, tap the file format selection.
6. At the bottom of the screen, tap the **Export** text button. The export proceeds.
   A subscreen opens to report export progress and outcome.
7. Tap the **OK** text button to clear the subscreen.

The destination folders and image file names are generated automatically, based on the image name of the original image and time of export.

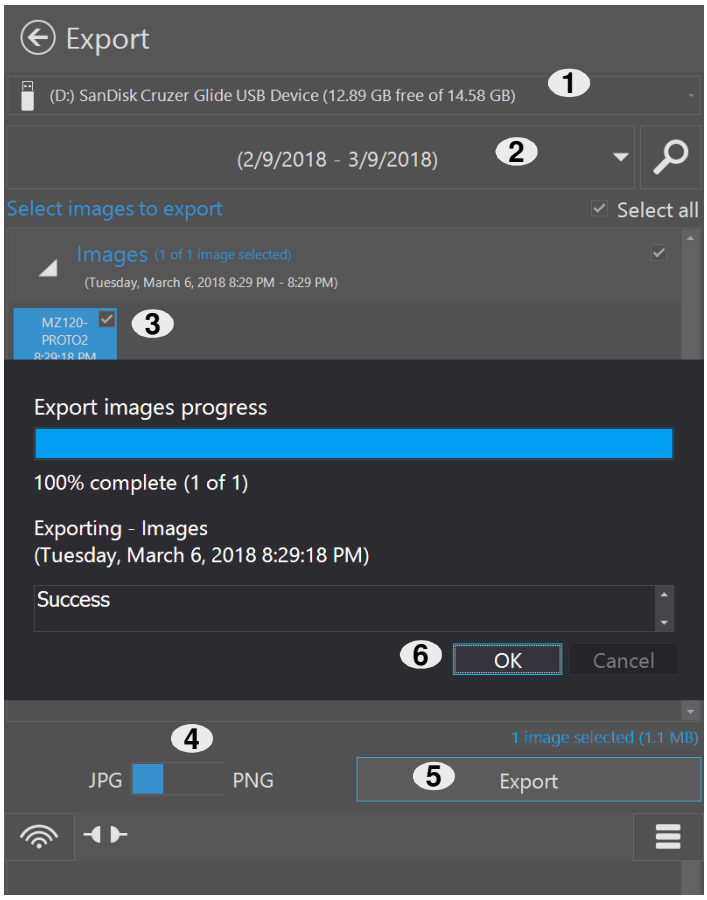


Figure 9-6: Export screen (typical) after image export. (1) Select Destination data store, (2) Search for images, (3) Select source images, (4) Select target file format, (5) Export button to create files, and (6) Accept notification.

9.7 Image Archive Libraries

Images that have been backed-up to an ASEInspection™ Software archive (also referred to as a ***library***, either a ***tablet library*** or a ***reference library***) should not be modified outside of the ASEInspection™ Software. All of the image data are stored on the external storage device, in a top-level folder named **Archive**. The archive is an optimized data structure and should not be managed manually. If the archive must be copied or moved, it should be copied or moved as a single entire folder. Select the entire folder, including all subfolders and contents, and copy or move it. If images from the same tablet were previously archived to the same storage device, the new images are added to the same archive folder.

Exported images (see Section 9.6, Exporting Images) are stored in a top-level folder named **Images**. These are files not used in the ASEInspection Software, so the user may rename these files, and copy and move them individually.

Incident Reports (see Section 11.9, Incident Reports) are stored in a top-level folder named **Incident Reports**. These files are not used in the ASEInspection Software, so the user may rename these files, and copy and move them individually.

9.8 Reference Images

Reference images are normal individual scanned images that have been backed-up specifically to a Reference library to facilitate sharing with other tablets. The images are stored, along with Reference images that can be from backups of other tablets, in the **Archive / Inspections/ Reference** folder on the target storage device. When a Reference image is restored to a MINI Z tablet, it is automatically designated as a Reference image (when searching for such images on the MINI Z, select the **Reference Images** criterion, see Section 9.7).

9.9 Backup of Images

Images can be backed-up from the tablet internal hard drive to the tablet SD storage device ports or to the USB-A port. The USB-A port is convenient for storing Reference images, because the removable storage device can then be readily disconnected from the tablet and conveyed to another MINI Z tablet for restoring the Reference images. The SD ports are covered by the Main Battery.

CAUTION

The Backup utility creates an optimized library data structure that must not be modified manually. For more information, see Section 9.7, Image Archive Libraries.

The MINI Z backup utility allows images and image groups to be located using the tablet built-in parametric search engine (Section 9.4.2, Using Search Criteria). All matching images and groups appear in the Backup Screen Content pane, which displays the header for each group containing matching images. Tap a header to expand it to display all of the matching images in gallery mode.

From this set of matching images, the user can select the individual images and groups to be backed-up (see Section 9.10, Restoring Images). For Multiple Images groups, backup and delete apply only at the group level.

The MINI Z backup utility allows the user to choose to:

- Backup and delete – Move the selected images from the tablet to the storage device, or
- Backup – Only copy the selected images to the storage device, leaving the original images on the tablet hard drive.

To backup images and groups, perform the following steps:

1. Ensure that a removable storage device is mounted (see Section 9.9, Backup of Images).
2. In the tablet ASEInspection Software Home Screen, tap the **Backup** button. The Backup screen opens (see Figure 5-8).
3. Tap the Library button (see Figure 9-7). A list of destination libraries displays:
   - If the image or group should be archived as normal scanned images, tap the **Tablet Library** choice in the list.
   - If the image should be archived as a Reference image (see Section 9.8, Reference Images), tap the **Reference Library** link.
4. Tap the Destination Storage Device button (see Figure 9-7). A list of connected storage devices displays. Tap the intended device.

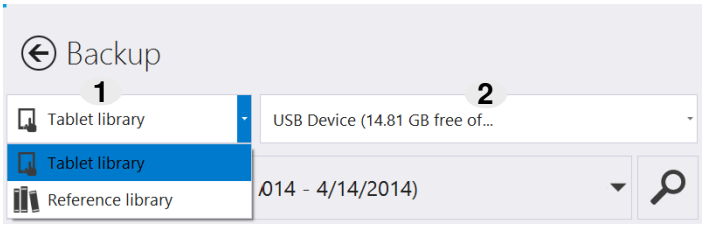


Figure 9-7: (1) Library button, and (2) Destination Storage Device button.

5. Search for images or image groups using the search criteria functions. For details of image searching, see Section 9.4.2, Using Search Criteria.
6. Use the **Select All** button or the controls in the Content pane to choose which images or image groups to include in the backup.
7. To backup copies of images while leaving the original images on the tablet, tap the **Backup** button. Otherwise, to copy images to the storage device and then delete the original images from the tablet, tap the **Backup and Delete** button. The selected action is performed.

The Backup process places the files in a top-level folder titled **Archive** \ **Inspections** \ **Tabletnnnn** in the destination storage device. All backups are placed there, in subfolders listed by date (YYYMMDD). For each date, the backed up files are placed in folders labeled with the image ID number, unique within the tablet. For each file, raw image files, data files, and a JPEG version of the full image are stored.

8. Perform additional searches and transfers as required. To do so, return to step 5 in this procedure.
9. When all actions have been completed, in the upper corner of the touchscreen, tap the Back button to return to the Home Screen.

9.10 Restoring Images

The **Restore** utility copies images from an archive that had been previously created. The archived images remain on the external storage device.

The restore process allows the user to locate images and image groups in the archive by using the tablet search engine (Section 9.4.2, Using Search Criteria). All matching images and groups appear in the Restore Screen Content pane, which displays the header for each matching group. Tap a header to expand it to display all of the matching images in that group in gallery mode.

From this set of matching images, the user can select the individual images and groups to be restored (see Section 9.10, Restoring Images). For Multiple Images groups, restoring applies only at the group level.

To restore images, perform the following steps:

1. Ensure that a removable storage device is mounted (see Section 9.9, Backup of Images).
2. In the tablet ASEInspection Software Home Screen, tap the **Restore** button. The Restore screen opens (see Figure 5-7).
3. At the top of the Content pane, tap the Source Storage Device button (see Figure 9-8). A list of available storage devices displays.Tap the storage device to use.

   The tablet searches the selected storage device, and updates the Library list with the names of all libraries on the external storage device.

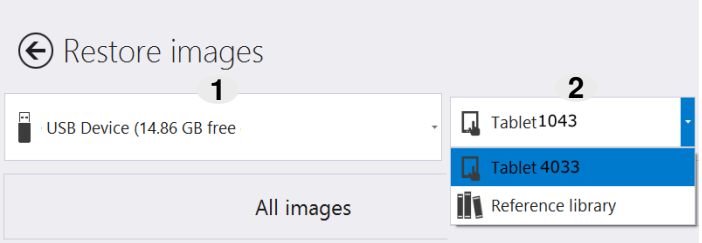


Figure 9-8: (1) Source Storage Device button, and (2) Library button.

4. If no MINI Z archives are found on the device, at the top of the screen the Library button displays: **No Libraries Found**. In this case, locate an external storage device with an AS&E archive.
5. Otherwise, if MINI Z archives are found on the device, tap the Library button. A list of libraries by image type displays:
   - If the libraries contain normal scanned images or image groups, the libraries are listed individually by the serial number of the tablet used to create the library.
   - Images backed up as Reference images are all included in a single library labeled **Reference Library**.
6. Search for images or image groups using the search criteria functions. For details of image searching, see Section 9.4.2, Using Search Criteria.
7. Use the **Select All** button or the controls in the Content pane to choose which images or image groups to include in the restore.
8. Tap the **Restore** button. The images are restored to the tablet from the archive.
9. Perform additional searches and uploads as required. To do so, return to step 1 in this procedure.

10. When all image actions have been completed, in the upper corner of the touchscreen, tap the Back button to return to the Home Screen.

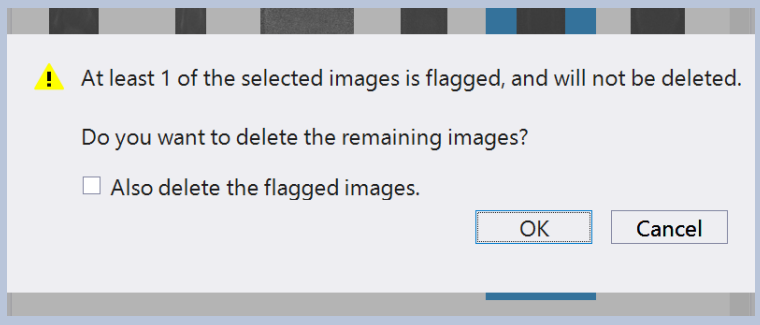
9.11 Deleting Images

Images can be deleted from the tablet as follows:

1. Search for images in the Review and Delete Search Mode Screen. See (Section 9.4.2, Using Search Criteria).
2. Select images in the returned gallery view. See (see Section 9.10, Restoring Images). From the set of matching images returned in the gallery view, the user can select all, select individual images, or groups to be deleted. For Multiple Images groups, deleting applies at the group level; individual image cannot be separately deleted.
3. Tap the **Delete** button at the bottom of the screen. If any images in the selected set are flagged, and acknowledgement subscreen opens (see box below). Otherwise, a confirmation subscreen opens.
4. Tap the **OK** button to confirm the deletion and clear the subscreen.

Images that have been flagged are not automatically deleted. Images that have been flagged are indicated by a red flag in the comment area of the image thumbnail .

This is to prevent inadvertently deleting flagged images when the select group or select all methods are used. If a selection includes images that have been flagged, the ASEInspection Software warns the user with the subscreen message shown here. The user must explicitly tap the check box and also the OK button to acknowledge that any and all included flagged images should be deleted.



Chapter

10

User Accounts

This chapter provides detailed descriptions of the steps required to set up user accounts. The system supports both normal and strong password protection to access the ASEInspection™ Software application. Individual user accounts can be created, and various options can be configured.

There are two categories of user accounts: ***Supervisor*** and ***Operator***. Account administration is performed in two screens, which are accessed by tapping the **Settings** button  in the Home Screen:

- **Users** screen – create and manage individual user accounts (Section 10.5, Settings Users Mode Screen)
- **Policies** screen – edit overall account privileges such as time-outs and password requirements (Section 10.7, Settings Policies Mode Screen)

These two screens appear only for supervisor login accounts (the linking buttons do not appear in the screens for Operator login accounts).

When creating additional user account names, the tablet manufacturer recommends: *Do not use the following words for user name: CON, PRN, AUX, CLOCK$, NUL, COM1 to COM9, LPT1 to LPT9, &, space, or @.*

In particular, if you create a user name (account name) that includes the "@" mark, a password will be requested at the log-on screen, even if no password has been set. If you try to log on without entering a password, "The user name or password is incorrect." may be displayed and you will not be able to log on to Windows.

When the system is shipped from the factory, the Automatically Login User feature (login without password) feature is enabled by default to allow a supervisor account to set-up the system. AS&E recommends changing this setting as soon as convenient (refer to Section 10.7).

The automatic login feature works only when the tablet is being opened for the first time after being turned on. If the tablet times-out and goes into sleep mode, when the tablet is awakened, the Login screen is displayed, and the user must either login in normally (with password) or restart the tablet.

The login to the ASEInspection™ Software application is distinct from the login to the Windows operating system. Login to Windows is required for restricted access to perform system set-up tasks. To prevent unauthorized access to Windows, change this password.

10.1 Login Screen

Typical login to ASEInspection™ Software requires a preassigned user name and password. When the tablet powers-up, the Login screen is displayed, shown in Figure 10-1.

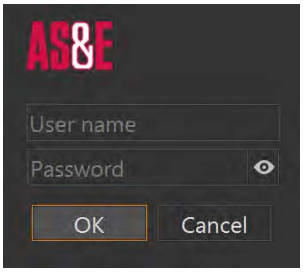


Figure 10-1: Main login screen for opening the ASEInspection Software

1. Tap the **User Name** text entry box to place the text cursor. The on-screen keyboard opens.
2. Use the on-screen keyboard to type the user name. The user name is not case-sensitive.
3. Tap the **Password** text entry box to place the text cursor.
4. Use the on-screen keyboard to type the password. The password is case-sensitive. For password requirements, see Section 10.3.

By default, the password is masked. To interactively view the password in plain text after entering it, tap and hold the Eye button at the end of the text box.

To lock the upper case characters, double-tap a shift-lock button (upward arrow on the on-screen keyboard).

5. Tap the **OK** button to submit the login.

10.2 Changing Users (Logout-Login)

To leave the ASEInspection Software during normal operations, without shutting down the system, and allow another user to login, perform the following steps:

If this procedure is canceled while partially complete, the ASEInspection Software closes automatically, and the tablet shuts down.

1. Return to the Home Screen (in primary screens tap the Back button ).
2. Near the top corner of the **Home** screen, tap the **Logout** button  . The previous user is logged out.
3. The Login screen (see Figure 10-1) is displayed. The next user should sign in, as described in Section 10.1.

10.3 Password Requirements

These password requirements apply for login to the ASEInspection Software application (these do not relate to the Windows operating system access password). A supervisor account can set the rules for passwords. For information on password policies, refer to Table 10-3.

- Normal passwords have no restrictions

- For Strong password protection, the passwords must contain:
  - 8 to 14 characters (case-sensitive)
  - At least one upper case letter (A-Z)
  - At least one lower case letter (a-z)
  - At least one numeric character (0-9)
  - At least one special character: @ ” ! # $ % ’( )* + , - . / : ; < = > ?[\ ]^ _`{ | } ~
  - No more than two numbers together
  - No character repeated together
  - No three consecutive letters or numeric characters (whether in ascending or descending order)
  - No blank spaces
  - Not the account User Name (the login account identifier used in this system)

10.4 Changing Passwords

For security reasons, the ASEInspection Software user account passwords are usually configured to require changing periodically (see Section 10.7). When the time has come to change a password, the ASEInspection Software displays a notice on the login screen the next time the user attempts to log in. Both supervisor accounts and Operator accounts may change passwords at any time sooner than the mandatory time limit. The Change Password screen appears as in Figure 10-3.

To change the user account password, perform the following steps:

1. In the Home Screen, near the top corner, tap the **Change Password** button .

Figure 10-2: **Change Password** button (1), located at the top of the Home screen.

2. The Change Password screen opens, shown in Figure 10-3.

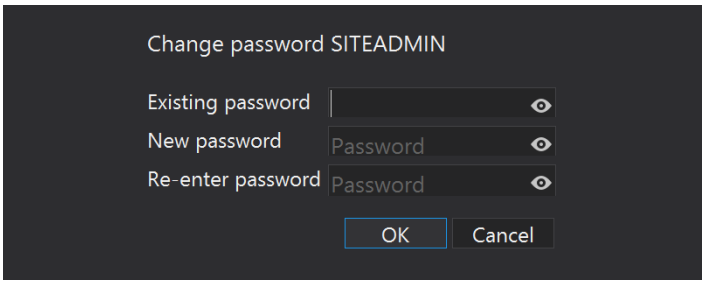


Figure 10-3: Change Password. Used to change existing passwords.

3. Tap the **Existing Password** box to open the on-screen keyboard and enter the current case-sensitive password of the user. (Optionally, tap and hold the Eye button to view the password characters to confirm they have been correctly entered.)
4. Tap the **New Password** box to open the on-screen keyboard and enter the new case-sensitive password of the user. For password requirements, see Section 10.3.
5. Tap the **Re-enter Password** box to open the on-screen keyboard and enter the exact same new case-sensitive password of the user.
6. Tap the **OK** button. The password is changed. The ASEInspection Software Home Screen opens.

10.5 Settings Users Mode Screen

The Users screen layout is shown in Figure 10-4. It allows the creation and editing of supervisor and operator user accounts. This screen is available only to supervisor login accounts, and is accessed through the **Settings** button on the Home Screen.

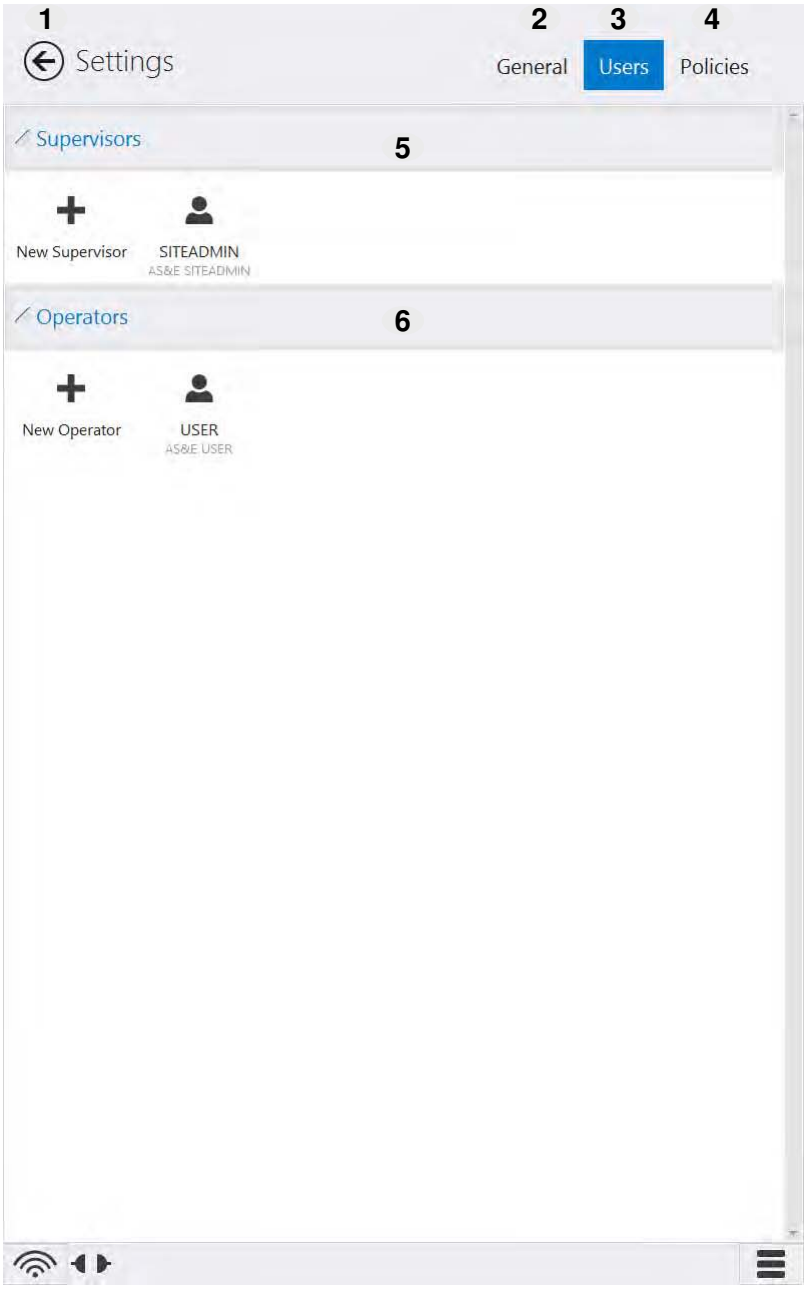


Figure 10-4: Settings Users Mode Screen Layout. The buttons are described in Table 10-1.

Table 10-1: User (Settings) Screen Description

Key	Name	Description
	Navigation Bar (top of screen)	
1	Back button 	Tap once to return to the Home screen
2	General button	Tap once to open the Settings General Mode Screen
3	Users button	Highlighted background indicates this screen is the current screen
4	Policies button	Tap once to open the Settings Policies Mode Screen
	Content Pane (middle of screen)	
5	Supervisors header	Header for all supervisor accounts. Tap once to open a list of all current supervisor accounts. To create a new supervisor account, tap the **New Supervisor** (**+**) button. To view or edit an existing supervisor account, tap the button representing that account. Both open the Modify list.
6	Operators header	Header for all Operator accounts. Tap once to open a list of all current Operator accounts. To create a new Operator account, tap the **New Operator** (**+**) button. To view or edit an existing Operator account, tap the button representing that account. Both open the Modify list.
	Status Bar (bottom of screen): see Section 3.5	

10.6 Modifying User Accounts

The **Modify** user accounts layout is shown in Figure 10-5 (the layout is the same for either adding or modifying user accounts). It is used by supervisor accounts to enter data for supervisor or operator accounts, to create, or to modify them.

When entering data into the Modify lists, note that the on-screen keyboard covers the command buttons at the bottom of the list (**OK** and **Cancel**). Tap the “X” button at the top corner of the keyboard to close the keyboard.

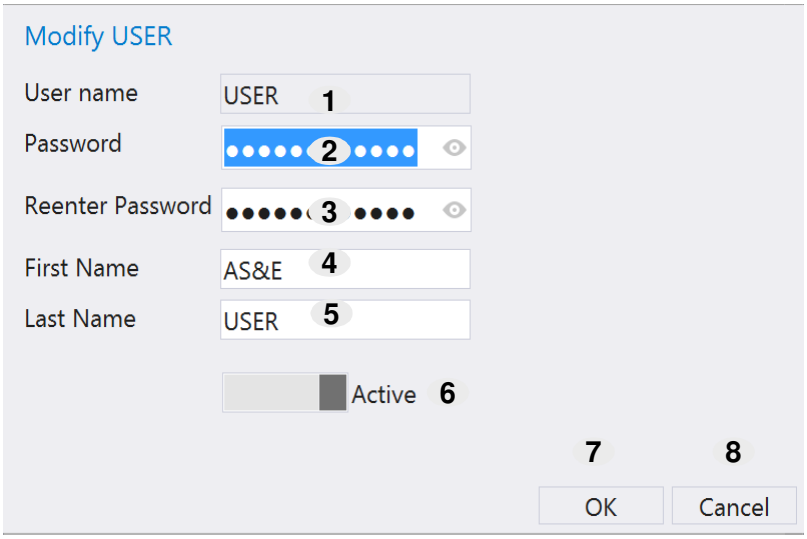


Figure 10-5: Modify accounts layout. The buttons are described in Table 10-2. The lower two buttons may be obscured by the on-screen keyboard.

Table 10-2: Modify Accounts Description

Key	Name	Description
1	User Name button	Tap once to open the on-screen keyboard and type a user name. User names must: •have 6 to 14 characters (not case-sensitive) •consist of only numerals (0-9) and letters (a-z, A-Z) •no blank spaces
2	Password button	Tap once to open the on-screen keyboard and type a password. For password requirements, see Section 10.3.
3	Reenter Password button	Tap once to open the on-screen keyboard and retype the exact password. This must match the entry in the Password field.
4	First Name button	Type the first (given) name of the user. This is for account identification only, and there are no formatting requirements.
5	Last Name button	Type the last (family) name of the user. This is for account identification only, and there are no formatting requirements.
6	Active slide switch	Deactivated accounts are not allowed to log in. To activate the current user account, drag the switch block to the **On** side. To deactivate the user account, drag the switch block to the **Off** side.

Table 10-2: Modify Accounts Description (continued)

Key	Name	Description
7	OK button	Tap to save changes to the account. (Note: If the on-screen keyboard is displayed, it may have to be closed to access the button. Tap the X button in the top corner of the keyboard.)
8	Cancel button	Tap to discard changes to the account. (Note: If the on-screen keyboard is displayed, it may have to be closed to access the button. Tap the X button in the top corner of the keyboard.)

10.7 Settings Policies Mode Screen

The Policies screen layout is shown in Figure 10-6. It is used by supervisor accounts to set privileges and limit policies for supervisor and Operator accounts.

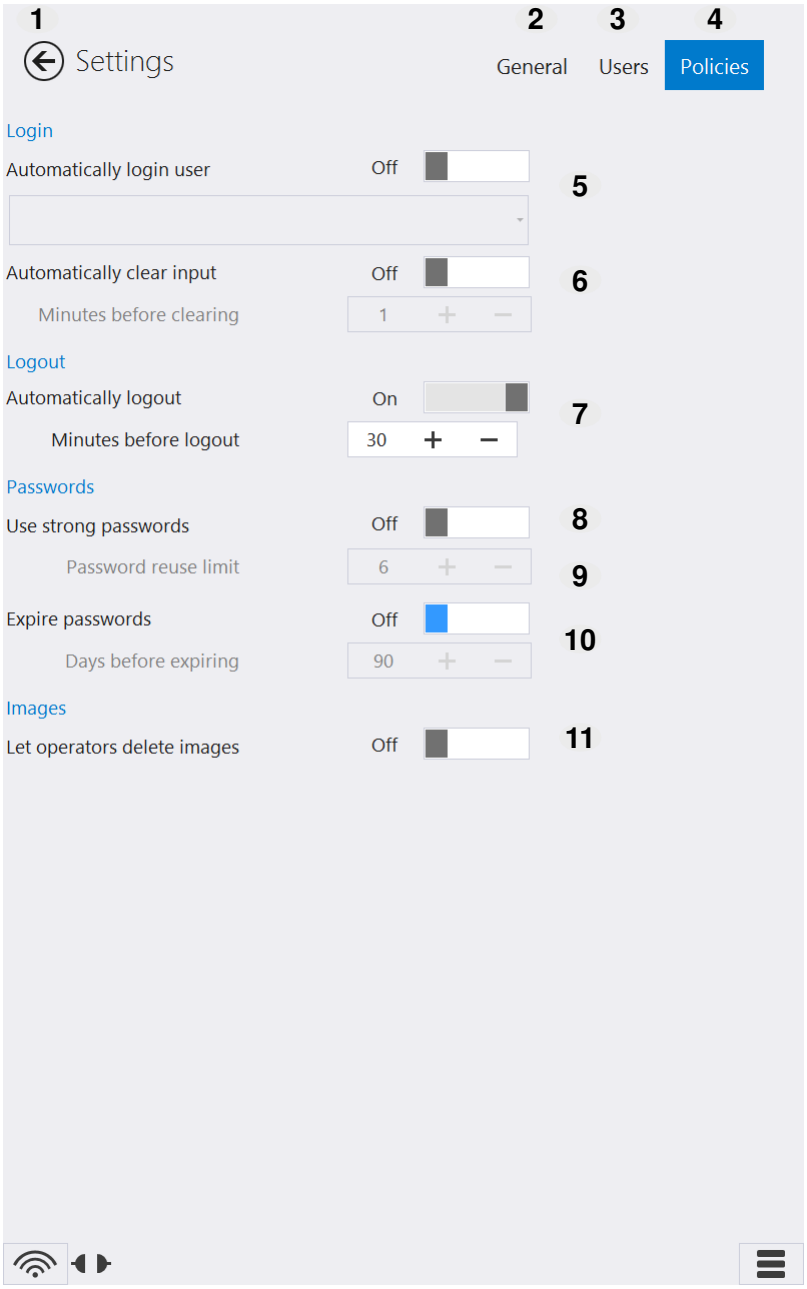


Figure 10-6: Settings Policies Mode Screen Layout. The buttons are described in Table 10-3.

Table 10-3: Settings Policies Mode Screen Description

Key	Name	Description
	Navigation Bar (top of screen)	
1	Back button 	Tap once to return to the Home screen
2	General button	Tap once to open the Settings General Mode Screen
3	User button	Tap once to open the Settings Users Mode Screen
4	Policies button	Highlighted background indicates this screen is the current screen
	Content Pane (middle of screen)	
5	Login: Automatically Login User	When this option is enabled, one Operator or supervisor account can be designated as the automatically logged-in account when the tablet is turned on. The AS&E application opens and the specified user has access, without having to enter any account user name or any password. (This does not allow a relog-in while the system is powered-up. If the system times out, a user must provide a user name and matching password, including if the user enters the user name of the account selected in this option.) This is not recommended except for short temporary periods for setup or training. •To allow automatic login, select the user in the drop-down box, and drag the switch block to the **On** side. •To disable automatic login, drag the switch block to the **Off** side. Note: The selected account remains designated until manually changed.
6	Login: Automatically Clear Input	Choose whether to delete login input if the user delays entry. Choose the number of minutes of inactive time a user is allowed after the tablet login is shown. Tap the numeral to open the on-screen keyboard, or tap the “+” and “-“ buttons to change the value in one-minute increments.
7	Logout: Inactivity Logout limit	Choose the number of minutes a user is allowed to leave the tablet idle (not contact the touchscreen) while the login screen is open. If this limit is exceeded, the user is automatically logged out. Tap the numeral to open the on-screen keyboard, or tap the “+” and “-“ buttons to change the value in one-minute increments.
8	Passwords: Enforce strong passwords	Choose whether users can use simple passwords or if they must use rigorous passwords that are more difficult to mimic. For Password specifications, see Table 10.3.

Table 10-3: Settings Policies Mode Screen Description (continued)

Key	Name	Description
9	Passwords: Password Reuse Limit	Sets the minimum quantity of new passwords the user must set before the user can reuse a password. •To enforce password changes by quantity of intervening passwords, drag the switch block to the **On** side. Tap the numeral to open the on-screen keyboard, or tap the "+" and "-" buttons to change the value in one-login increments. •To disable quantity limits, drag the switch block to the **Off** side.
10	Passwords: Expire Passwords	Limits the length of time the user can log in using the same password before they must change their password. •To enforce password changes by number of days, drag the switch block to the **On** side. Tap the numeral to open the on-screen keyboard, or tap the "+" and "-" buttons to change the value in one-day increments. •To disable quantity limits, drag the switch block to the **Off** side.
11	Images: Operators can delete images	Prevents the deletion of scan images by users with Operator accounts. •To limit image deletions to users with supervisor accounts, drag the switch block to the **Off** side. •To allow both Operator and supervisor accounts to delete scan images, drag the switch block to the **On** side.
	Status Bar (bottom of screen): see Section 3.5	

Chapter

11

Maintenance

This chapter describes procedures for configuring and maintaining the MINI Z™ system. For information about managing system memory, see Chapter 9, Image Management. For information about managing batteries, see Chapter 12, Battery Care.

CAUTION

There are no user-serviceable parts inside of the system. Opening the scanner case or the tablet will void the warranty.

11.1 Touchscreen Cleaning

The tablet touchscreen has a low-reflectance optical coating that rejects dirt. For optimum performance, clean the touchscreen using a dry, clean microfiber soft cloth or similar. Do not use water or solvents to clean the touchscreen surface. At most, breathe on the surface to help loosen dirt.

Power- off the tablet and the scanner during cleaning.

CAUTION

Regardless of the setting here for Water mode, the tablet or the scanner must not be submerged in any liquid. When exposed to mists or spray, ensure battery connections are occupied, and the power connections are either occupied or the access panel closed tightly.

11.2 Tablet Dashboard (PC Settings)

The tablet provides a function named ***Dashboard***, referred to as the **Panasonic PC Settings Utility** in the operating system, that combines several commonly-used functions into one location.

CAUTION

This manual refers to the settings in the PC Settings Utility where they are required or recommended for use. In general, retaining the factory settings is recommended. Setting parameters without instruction from AS&E is not supported.

To access Dashboard through the Windows operating system, a supervisor-level login account must be used.

1. Access the Windows operating system using the usual methods (Section 3.7.1).
2. To open the **Panasonic PC Settings Utility** (Figure 11-1) (shortcut: press the "A" button  on the side of the tablet):
   a. In the Desktop screen tool tray, tap the Windows Start button. The applications menu opens.

   b. Flick up until the **Panasonic** folder appears. Tap the button to open the folder.
   c. Tap the **Panasonic PC Settings Utility** button (this opens the operating system version of the Dashboard).

To close the Dashboard, click the "X" button in the utility screen title bar or press the "A" button  on the side of the tablet (may take a few seconds).

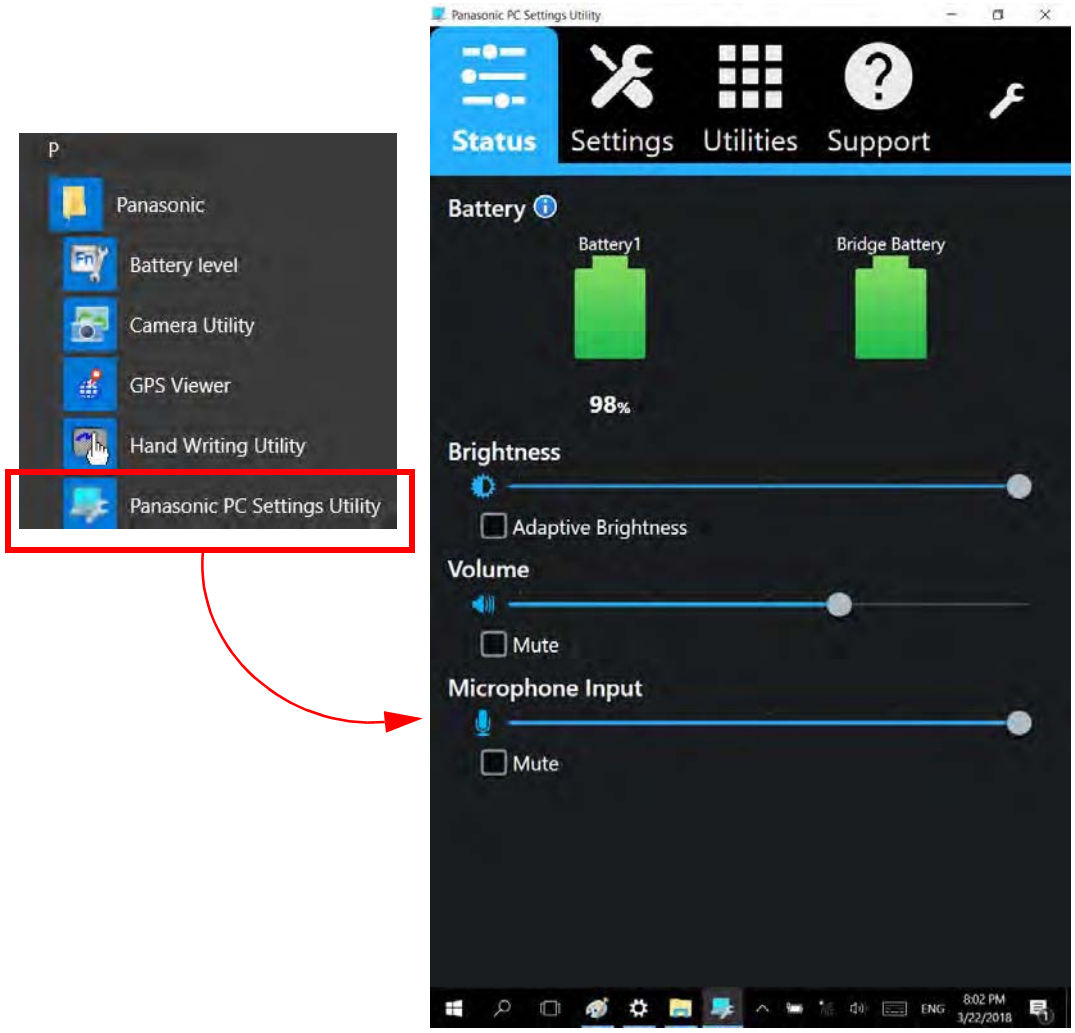


Figure 11-1: Dashboard (Panasonic PC Settings Utility) Typical Page.

11.3 System Security

- **System Updates** – The system supports anti-virus updates and system software updates.
  - A supervisor account can use the Microsoft® Windows® Defender Web-based utility to update the tablet software. A procedure is provided. See Section 13.2, Tablet Anti-Virus Updating.
  - ASEInspection system software updates may be issued to registered customers. The updates are self-installing, and instructions are provided with the software distribution.
- **Password and Removable Access (Tablet)** – There are several levels of security for system functions on the tablet:

- Access to the ASEInspection software application can be configured to require user name and password.
- Certain functions within the ASEInspection software application can be limited to supervisor-level user accounts.
- Access to the tablet operating system (Windows®) software is controlled by a separate password.
- The tablet can be removed from the physical location of the scanner unit, and secured in a separate location.

- **Removable Access (Scanner Unit)** – There are several levels of security for the scanner unit:
  - The scanner unit requires a physical, removable key to enable the power-on switch. When the scanner unit is powered-off, the key can be removed from the physical location of the scanner unit, and secured in a separate location. When the scanner unit is powered-on, the key cannot be removed from the scanner unit lockset.
  - The scanner cannot be operated with out a compatible tablet with the compatible ASEInspection software installed. The tablet can be removed from the physical location of the scanner unit, and secured in a separate location, and can have password access.
- **WiFi** – There are several levels of security for the WiFi connection
  - At any time, the Ethernet cable connection between the tablet and the scanner unit can be used. When the Ethernet cable is in use, the WiFi connection is disabled.
  - At any time, the WiFi function on the tablet can be disabled, by placing the tablet into Airplane mode. Enabling or Disabling Airplane mode requires access to the Windows operating system, which is controlled by a separate password.
  - The WiFi identity of the individual scanner unit can be disguised by changing the SSID identifier for the scanner. The SSID is changed using the tablet, and stored in the scanner unit system. Access to the SSID fields requires a supervisor-level user account. (See Section 3.6.3.4, Confidential SSIDs for Scanners.)
  - Confidential SSIDs are hidden by default, so that SSIDs cannot be read “over the shoulder” of the tablet operator. In order to display the custom SSID links, a tap of an additional innocuous button is required.
  - The tablet can be connected to only one scanner unit at a time.

11.4 Storage and Shipping

When not in use, the system should be stored in the Rugged Transport Case provided with the system (see Figure 11-2).

The system should be shipped only in the Rugged Transport Case provided with the system. A returned merchandise approval must be issued by AS&E Field Service before the system is shipped to AS&E or to an AS&E facility.

CAUTION

Special conditions apply to storing and shipping batteries. See Section 12.3.

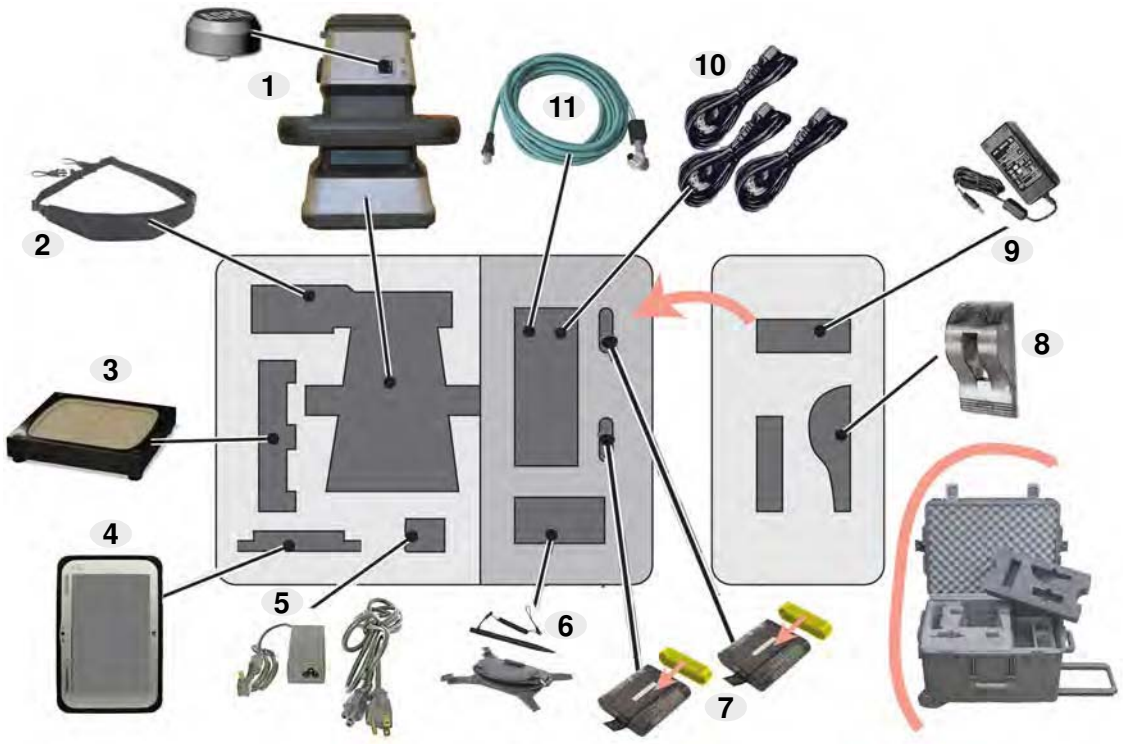


Figure 11-2: Repacking Rugged Transport Case (figure repeated in Table A-3

1. Scanner with Scanner key
2. Scanner Shoulder Strap
3. Calibration Dock
4. Tablet
5. Tablet power adapter with power cord
6. Tablet Stylus and Hand Grip
7. Scanner batteries (2), with contact covers
8. Scanner battery charger
9. Scanner battery charger power adapter and cord
10. Scanner battery charger cords for USA, UK, and EU
11. Ethernet cable

11.5 Connecting the Scanner Unit Shoulder Strap

The shoulder strap provided with the system is designed for wearing over one shoulder and under the opposite arm by the user (see Figure 7-1). Two loop connectors are provided that allow the user to slide the scanner up to the operating position without adjusting the strap (see Figure 11-3).

WARNING

The shoulder strap should always be used. It helps to reduce user fatigue, as well as prevent foot injury and damage to the scanner from accidental dropping by the user. Both loop connectors should always be used, to distribute the weight of the scanner.

The shoulder strap assembly includes the follow items:

- Shoulder Pad (with a male End Clip and a female End Clip)
- Strap (with a male Sliding Clip and male End Clip on one side and a female Sliding Clip and female End Clip at the other side)
- Loop with female Loop Clip
- Loop with male Loop Clip

The Strap and Pad are not symmetrical, so care should be taken during setup to ensure maximum user comfort by:

- Ensuring the straight middle side of the shoulder pad is toward the operator's neck when worn.
- Ensuring the bottom surface of the scanner is towards the operator's abdomen when worn.
- Ensuring the sliding clips are on the outside of the strap when worn (so the clips hang straight downward).

When properly set up, the strap does not have to be unclipped to change wearing from one shoulder to the other.

The two loop connectors are each constructed with a loop at each end. One loop fits on the shoulder strap to allow sliding the scanner along the strap. The other loop attaches to the mounting eyes of the scanner. Between the loops, a paired male-female clip allows quick release of the scanner from the shoulder strap.

Whenever the shoulder strap is used, it should be checked for fraying of the loops at the mounting eyes. Also, the condition of the clips and fasteners should be checked.

Figure 11-3: Shoulder Strap Assembly. The dashed line indicates the straight middle side of the Shoulder Pad, the side that is worn toward the operator's neck. (1) Rear of scanner unit, (2) eyes on scanner, (3) Shoulder strap with the two ends of the loop connectors already attached, and (4) Shoulder strap pad.

To assemble the shoulder strap, perform the following steps (refer to Figure 11-4):

1. Hitch the loops through the scanner mounting eyes:
   a. Hitch the Loop with the male Clip through the eye on the left side of the scanner.
   b. Hitch the Loop with female Clip through the eye on the right side of the scanner.
2. Place the Shoulder Strap and Shoulder Pad as shown on a flat surface, and connect the two Pad End Clips with the matching Strap End Clips.
3. Attach the two Sliding Clips of the Strap with the matching Loop Clips.

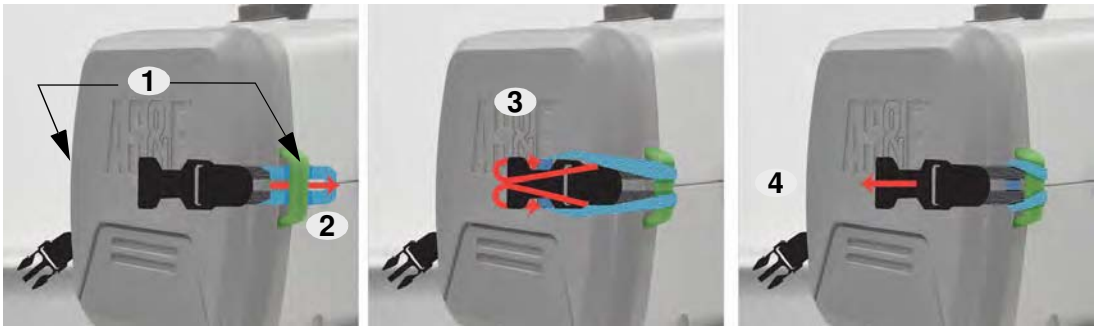


Figure 11-4: Shoulder Strap Loop Connector Male Side Assembly. (1) Mounting eye, one on each side of the scanner rear. (2) Male-side loop mounted through the eye, (3) over the clip, and (4) pulled tight.

11.6 Connecting the Tablet Hand Strap

The table hand strap provided with the system is designed for allowing the user to maintain a safe hold on the tablet without wrapping fingers over the buttons and touchscreen on the tablet itself. The strap is fitted over the back of the hand, providing protection against dropping the tablet accidentally (Figure 11-5).

Figure 11-5: Hand Position in the Handhold of the Hand Strap. The handhold section of the hand strap rotates 360 degrees, allowing holding with either hand, and any touchscreen orientation, without any reassembly.

The handhold section rotates 360 degrees, allowing holding with either the left hand or the right hand, and viewing the touchscreen in any portrait or landscape orientation, without any reassembly.

The hand grip is equipped with two types of connecting strips. This is to allow access to the Main Battery Pack and to the microSIM and microSD card bays without having to remove the hand strap from the tablet (Figure 11-6).

Figure 11-6: Hand Strap Position for Battery and Memory Card Access. (1) Buckle-type strips (for security), and (2) hook-and-loop strips (for easy loosening and tightening, during card and battery access). (3) Main Battery Pack, partially unloaded.

The hand grip strips are connected as shown in Figure 11-7. The same configuration is used for left- or right-handed use because the handhold rotates.

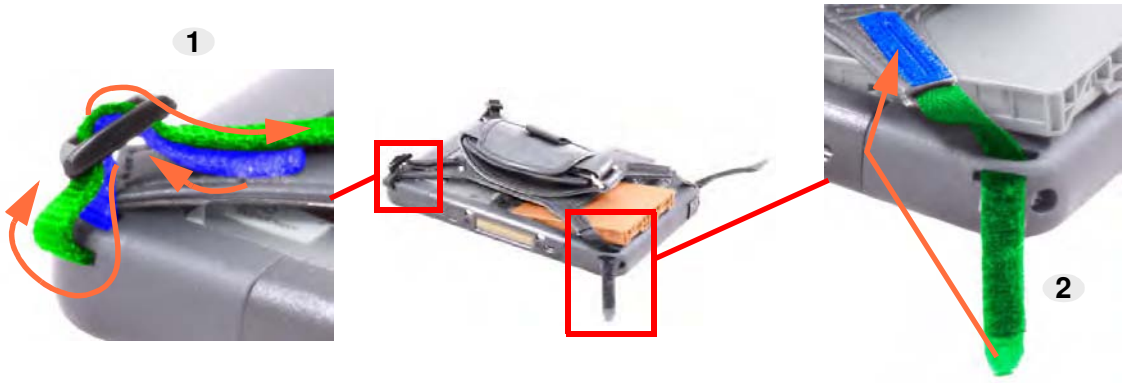


Figure 11-7: Hand Strap Strip Fastening. (1) Buckle-type strips: through the buckle, through the eye in the protective case, and then back through the buckle. (2) Hook-and-loop strips: through the eye in the protective case, and then back on to the surface of the hook section.

11.7 Recalibrating the Tablet Screen

If the screen does not respond to accurate touches, it may require calibration of the screen, to restore accurate reading of touch locations by the touchscreen. This procedure can be performed by a supervisor login account. Only a supervisor account can set the calibration for all use accounts. It is recommended that this procedure not be used unless the tablet has become unusable.

The screen may jump or wander when liquid is on the screen, including small amounts and when droplets are not close to the touch point. Try drying the screen if the screen behaves erratically.

It is recommended to attach an external keyboard to the tablet (USB-A port), so the recalibration procedure can be exited at any time, by pressing the **ESC** key on the keyboard.

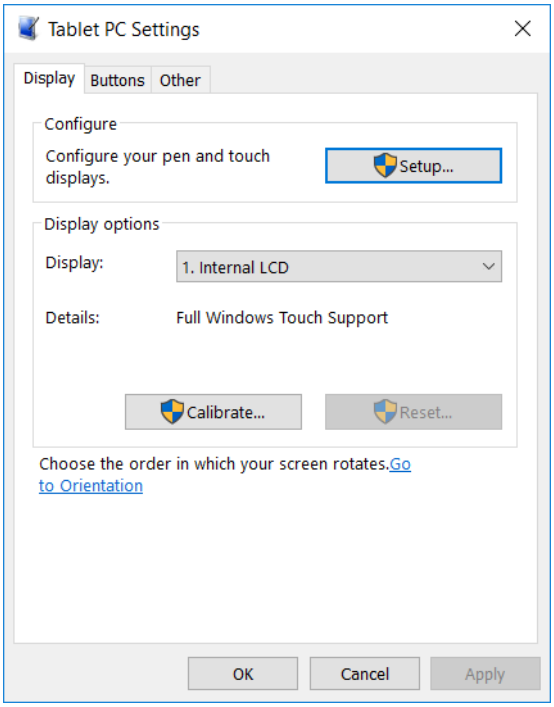
It is recommended to attach an external mouse to the tablet (USB-A port), to allow the operator to right click in the screen to return to the previous point to set it again.

It is recommended to use the finger touch, and to set the Touch mode to **Touch** (finger) (Section 3.7.5) to provide maximum accuracy for interactively locating the touch points. Although the Pen (stylus) choice might seem to be more precise, it does not always cause a screen response as reliably as the finger touch.

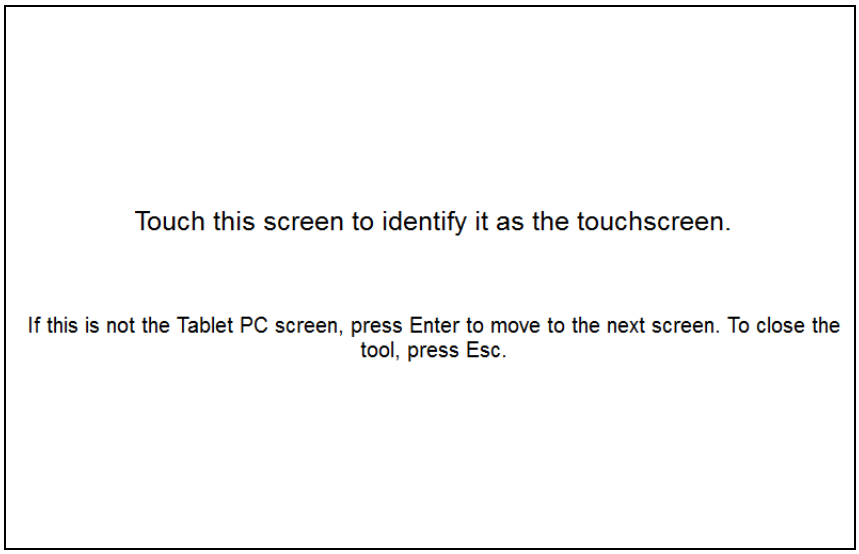
1. Rotate the tablet so the display is in landscape orientation.
   This is required because the calibration marks are based on a landscape layout.
2. Press the Autorotation button on the side of the tablet to lock the current orientation.

3. Enter the Windows operating system, using the normal methods.
   At the bottom of the Windows Desktop screen, a tool bar appears.

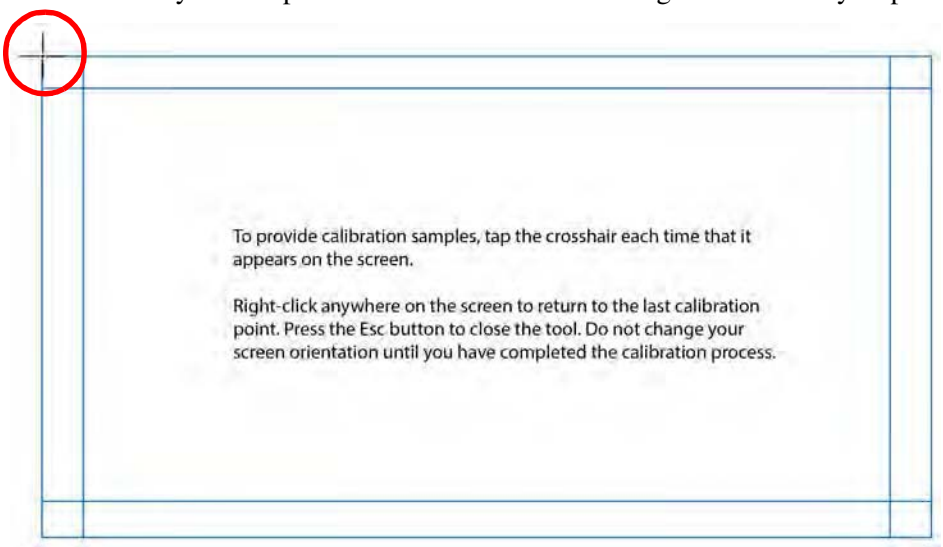
4. Tap the Windows Start button  . A menu appears.
5. Flick up until the **Windows System** folder appears. Tap the button to open the folder.
6. Tap the **Control Panel** button, and in the Control Panel, tap the **Tablet PC Settings** button. The dialog box opens.



7. In the **Display** tab, tap the **Setup** button. The screen updates. The user is prompted to tap the touchscreen to validate that the touchscreen is the screen to be recalibrated.



8. Tap the screen. The **Display** tab opens again. The **Display** option is **1. Internal LCD**. This is the only choice.
9. Tap the **Calibrate** button. The utility presents a series of screens with a crosshairs target in each. In each screen use the stylus to tap the center of the crosshairs target as accurately as possible.



10. Complete the procedure without changing orientation of the screen.
11. If the overall result is unsatisfactory, in the **Display** tab, tap the **Reset** button and try again.

11.8 Recalibrating the Scanner

Calibration of the MINI Z system is performed at the AS&E factory before shipment to the customer, and typically the system does not require recalibration. In the event a significant drop or other physical

shock is applied to the system, recalibration may be required. Recalibration requires use of the Calibration Dock reference standard (see Figure 11-9) provided with the system.

CAUTION

While the calibration procedure is not complex, the user is cautioned that it must be performed properly and in its entirety to optimize system performance

The recalibration procedure is controlled from the tablet, using the **Calibration** menu (Figure 11-8), which is accessed from the **Status Details** mode screen (see Figure 5-10). The button link in the Details screen, labeled **Calibrate Scanner**, appears only for supervisor login accounts and is located between the **Scanner** table and the **Tablet** table.

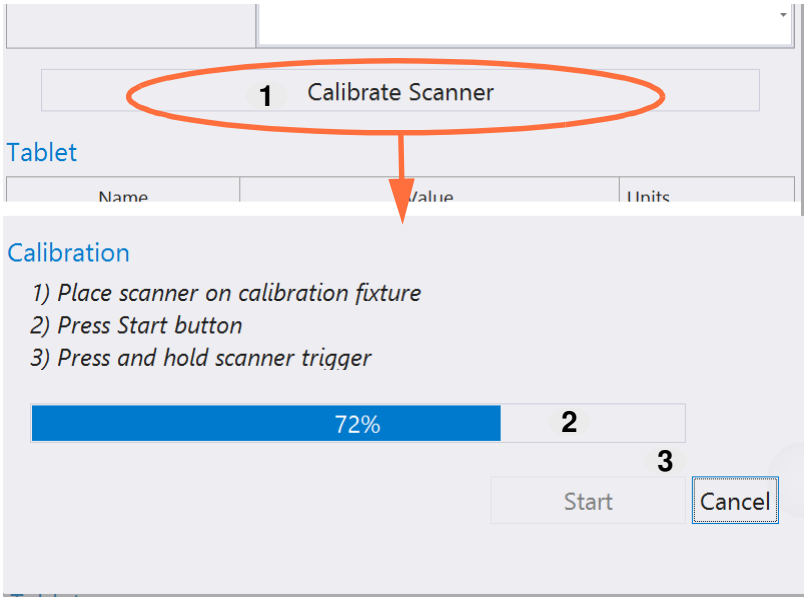


Figure 11-8: Calibration. This link button, **Calibrate Scanner**, is on the Status Details mode screen, but appears for supervisor user accounts only. The controls are described in Table 11-1.

Table 11-1: Calibration Description

Key	Name	Description
1	Calibrate Scanner button	Appears in Status Details mode screen for supervisor user accounts only. Tap to open Calibration screen.

Table 11-1: Calibration Description (continued)

Key	Name	Description
2	Progress Bar	Bar fills (and text percentage updates) proportionally to indicate progress of recalibration process.
3	Start button	After seating scanner in Calibration Dock, tap this button to enable emissions from scanner (trigger button on scanner handle must then be pressed to begin recalibration process and X-ray emissions, and held through the entire process).

Figure 11-9: Calibration Dock application. (1) The MINI Z face is the section at the front of the scanner. (2) The dock itself is configured like a small block with a shallow alignment collar. Place the dock on a horizontal surface, with the four mounting feet downward. (3) Seat the face down into the dock, making sure the front face of the face rests uniformly against the inside of the dock mounting collar.

If the system requires a warm-up, the warm-up must be completed before the recalibration. For more information, see Section 6.1.1, Scanner Unit Warm-Up.

To complete a system recalibration, perform the following steps:

1. Locate the Calibration Dock, and place it on a horizontal surface, with the mounting feet downward.
2. As shown in Figure 11-9, align the face of the scanner to fit the dock mounting collar and then insert the face, until the front bumper of the face rests firmly against the bottom of the dock recess.

WARNING

It is good practice to never position any part of the user's body in front of the emission surface at the front of the scanner, or to allow any person to be in that position. If the fixture is placed on a table, ensure no person is sitting with legs under the table.

3. Power-on the tablet and the scanner (see Section 3.4.1, Powering-On the Tablet).

4. Login in to a supervisor account in the ASEInspection™ Software.
5. In the Home Screen, tap the Status button , in lower corner of screen. The **Status** screen opens.
6. If necessary, in the upper corner of the screen, tap the **Details** button, to open the **Details** screen.
7. Between the **Scanner** table and the **Tablet** table, tap the **Calibrate Scanner** button. The Calibrate menu opens (see Figure 11-8).
8. If the scanner is in Standby Mode (Status LED on the scanner housing is steady yellow), press and quickly release a trigger button on the scanner handle. The Status LED changes to blinking green.
9. In the Calibration screen, tap the **Start** button. The Status LED changes to steady green.

WARNING

The next step results in the emission of X-rays.

10. On the scanner, press and hold a trigger button.
    - The four "X-ray On" warning lamps on the scanner handle illuminate (red), and a beep sounds.
    - X-rays are emitted.
    - In the tablet Calibrate screen, a progress bar indicates the passage of time while the scanner performs a sequence of graduated warm-up stages.
11. At the end of the calibration procedure:
    - The four "X-ray On" warning lamps on the scanner handle extinguish.
    - The system beeps twice.
    - The tablet Calibration screen closes.
12. Release the trigger button.

If the trigger button is released before the full period has elapsed, X-ray emission will stop immediately and the calibration will have to be performed again.

13. To verify the calibration, perform a scan while the scanner remains in the dock. The calibration result is viewed in the Scan Monitor Mode Screen after the scan completes. The Calibration Dock has an embedded target (visible in Figure 11-9) that should be imaged as a single, vertical dark line, centered (left-right) in the screen (Figure 11-10).

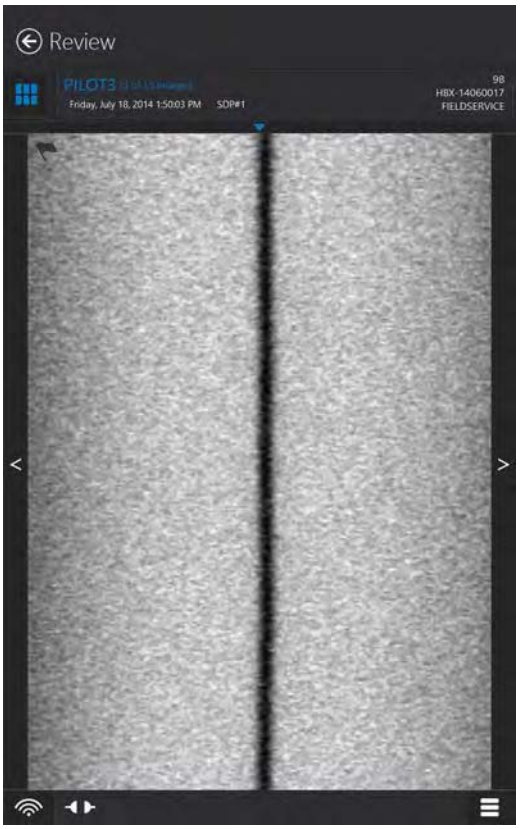


Figure 11-10: Recalibration screen image after completion

14. Remove the Calibration Dock and store it properly for the next use.

11.9 Incident Reports

In the event that a system malfunction requires notification of the AS&E Field Service team, an integrated utility is available to prepare a report for electronic transmission to AS&E. The Incident Reports utility pulls together a variety of different types of files that indicate the current operating condition of the system being analyzed. These files can include recent log files, tablet registry files, database files, configuration files, and a text file that includes the user's own description of the circumstances and contact information. The files are bundled and compressed in a standard ZIP file for ease of transfer. The report is assembled and exported to the Incident Reports/ folder in the destination storage device. For more information, see Section 9.3, Sharing External Images.

To prepare an incident report, perform the following steps:

1. Insert a USB thumb drive into the USB-A port on the tablet or a microSIM or microSD card into the slots in the Main Battery bay (for locations, see Figure 4-3 and Figure 4-4). This will be the medium for transferring the images to the external computer system.
2. In the Home Screen, tap the **Settings** button. The Settings screen opens.
3. At the top of the screen, tap the **General** button. The General screen appears (see Figure 5-11).
4. Tap the **Create Incident Report** button. A menu opens, shown in Figure 11-11.
5. Complete the steps described in the menu (see also Table 11-2).
6. Tap the **Create** button to generate the incident report.

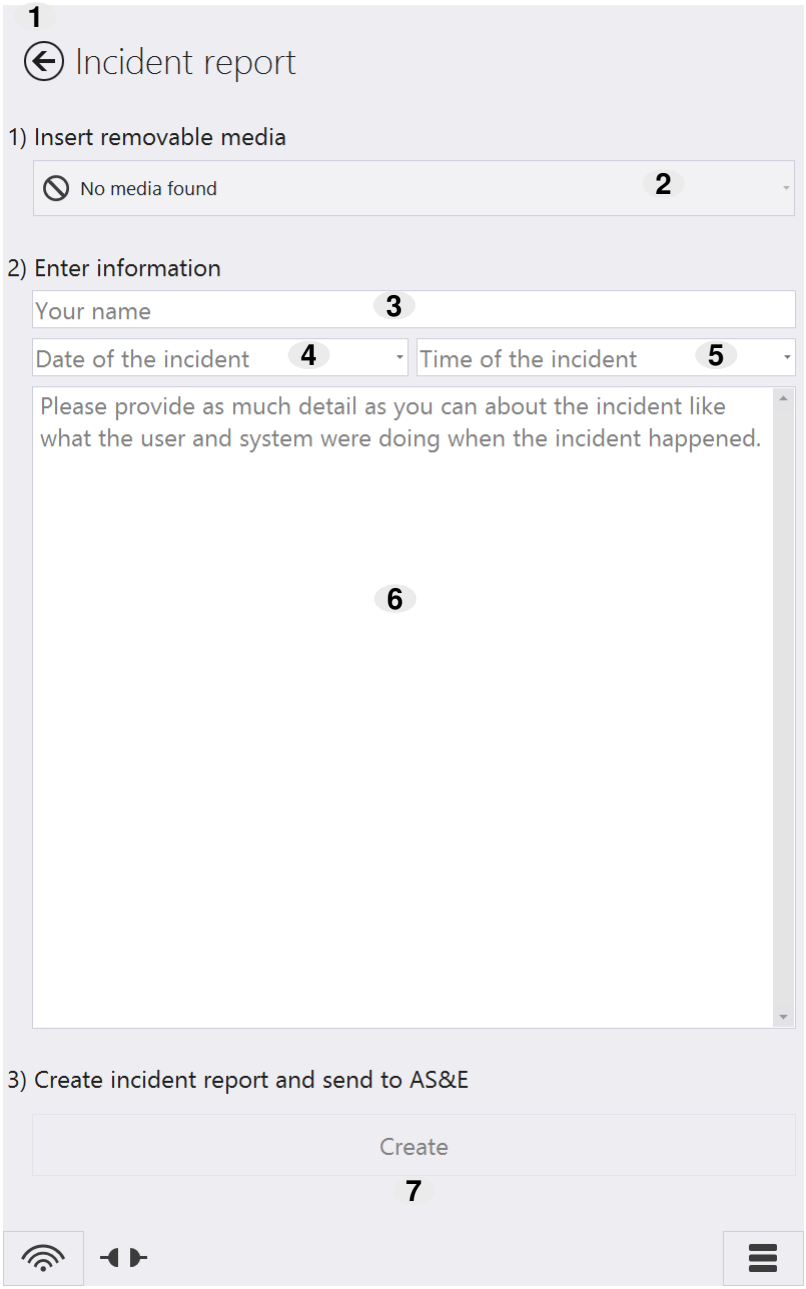


Figure 11-11: Incident Reports Layout. The buttons are described in Table 11-2.

Table 11-2: Incident Reports (Settings) Screen Description

Key	Name	Description
	Navigation Bar (top of screen)	
1	Back button	Tap once to return to the Home Screen
	Content Pane (middle of screen)	
2	Destination Storage Device	Tap to open a menu of available external storage devices
3	Name of the Contact Person	Tap and enter the name of the contact person filing the report
4	Date	Tap to open a selection spinner. Flick fields up or down to select the Date the incident occurred (local time) (see Section 9.4.4, Date and Time Selection)
5	Time	Tap to open a selection spinner. Flick fields up or down to select the Time the incident occurred (local time) (see Section 9.4.4, Date and Time Selection)
6	Incident Description	Tap and enter all available details about the incident
7	**Create** button	After all information has been entered, tap to create a report and export it to the destination storage device.
	Status Bar (bottom of screen): see Section 3.5	

Chapter

12

Battery Care

This chapter describes procedures for use and recharging of the scanner battery and tablet of the MINI Z™ system.

CAUTION

There are no user-serviceable parts inside of the battery packs, adapters, or chargers. Opening the enclosures will void the warranty.

Batteries should only be replaced with compatible quality batteries. Risk of overheating or explosion if improper batteries are installed, and will void the warranty.

Do not use batteries that have been dropped, are wet, or have been exposed to excessive heat, or are swelling.

12.1 System Batteries

The two main batteries in the system, in the tablet and in the scanner, should be fully charged before beginning operations with them. Depending on the state of charge, the initial charge time is less than 4 hours for the scanner battery, and 2.5 hours for the tablet battery.

- The removable batteries in the scanner unit and the tablet are Li-ion. When carrying outside of the scanner or tablet, ensure that the battery terminals are covered.
- The scanner comes with two batteries (one is a spare) and an external battery charger to charge the battery while it is not installed in the scanner body. It is recommended that both batteries be fully charged before starting operation, to ensure uninterrupted operation.
- The tablet comes with a replaceable main battery and an external AC adapter to charge the battery while it is installed in the tablet body. The DC power port is used for connecting the charger cable. Always disconnect the AC adapter from the DC power port before removing or inserting the main battery. While the main battery is inside of the tablet body, plug the external charger into the DC power port and a compatible mains power source and for normal operation, charge the main tablet battery until the battery is full. Then disconnect the AC adapter cable.
- The tablet is equipped with an embedded bridge battery, which carries a small charge allow a quick hot-swap of the replaceable main battery without powering off the tablet.

The scanner battery and tablet charge levels should be checked, using the corresponding screens in the tablet, at the beginning of each scan session, and periodically during scanner operation. At the end of a scanning session, battery and tablet charge status should be checked and recharging performed if necessary, in order for the devices to be immediately ready to resume scanning when required.

The scanner battery and the tablet removable batteries are Lithium-ion type. When the battery can no longer hold the required charge or is damaged, it should be disposed of properly according to local regulations for this type of battery. You can also return the battery to AS&E if you are unsure of your local regulations for Lithium-ion battery disposal.

12.2 Extending Battery Life

Battery charge can be best conserved by keeping the battery out of temperature extremes and by turning-off the system when not in use (not using Sleep mode), and removing batteries when they will not be used for a long period. Rechargeable batteries have a limit to the quantity of times they can be recharged. This is a result of a small residual deterioration.

To avoid temperature build-up during recharging the tablet main battery pack, consider turning off the tablet during recharging.

The scanner battery is a special smart battery. It contains an internal serial number that can be read out to the tablet. It is rated to be recharged 300 times before the recharge capacity drops to 80% of the new-battery level. To help predict use life, the battery logic tracks each recharging event, and the cumulative total of recharges can be read out to the tablet. If the battery is connected to the charger while it still retains more than 90% of full charge, the charger will not start a charging cycle.

When the scanner unit rechargeable battery is depleted, it is designed to retain sufficient residual charge to continue to power the control circuits of the device and allow recharging. Immediately recharge a fully depleted battery:

• Do not store a depleted battery before recharging to at least 50% of full charge (100% is ideal for maximum storage life).

• Do not connect a depleted battery to an unpowered charger.

• Do not attempt to continue to use a depleted battery.

The tablet reduces the full charge level of the main battery pack gradually over time, in order to extend battery life. Every time the battery is recharged, it reduces the remaining use life, so the manufacturer recommends not recharging the battery until it reaches 10% remaining. This level is indicated by the battery indicator on the touchscreen frame  displaying red. If the battery is connected to the charger while it still retains more than 95% of full charge, the charger will not start a charging cycle.

12.3 Storing and Shipping Batteries

Tablets can reduce battery consumption by lowering screen brightness. See Section 3.7.6, Screen Brightness Setting.

The scanner batteries should be recharged with 100% of full charge for shipment or for long-term storage between 20°C and 30°C and check every 9 months or sooner if elevated temperatures are experienced. If below 50% of charge, the battery should be recharged to 50% for continued storage, or to 100% of full charge if it will be used immediately (see also Section 12.5).

The tablet consumes power when the tablet is fully off and when in Sleep mode. If the tablet removable main battery pack will not be used for a long period of time (a month or more), charge or discharge (use) the battery pack within the allowable temperature range of 0°C to 50°C (32°F to 122°F) until the remaining battery level becomes 30% to 40% (ASEInspection software can be used to measure the charge on the battery; see Section 12.4.6) and then remove the battery, cover the terminals, and store it in a cool 10°C to 30°C (50°F to 86°F), dark place.

The scanner battery and the tablet main battery pack are Lithium-ion type and should be removed from the scanner and the charger, and from the tablet before shipment or storage. When shipping by air, labeling should conform with IATA rules. During shipment and storage, the battery contacts should always be covered, using the battery covers provided for the scanner batteries (Figure 12-1), and a plastic bag for the tablet main battery pack.

Figure 12-1: Scanner Battery Cover Application. (1) The cover slides over the end of the battery and completely covers (2) the multiple recessed contacts.

When using in low temperature environment, if you are using battery power and the remaining power is low, startup may become slow or fail, or battery operation time may become short because of power consumption by the flash memory drive warming up during startup.

12.4 Tablet Batteries

The tablet has three batteries:

- a Lithium-ion removable main battery that provides main tablet power
- an embedded Lithium-polymer “bridge” battery that provides power while the main battery is being replaced (referred to as hot swapping) or while the battery is being removed to allow access to the data storage card bay
- an embedded Lithium clock / system date battery

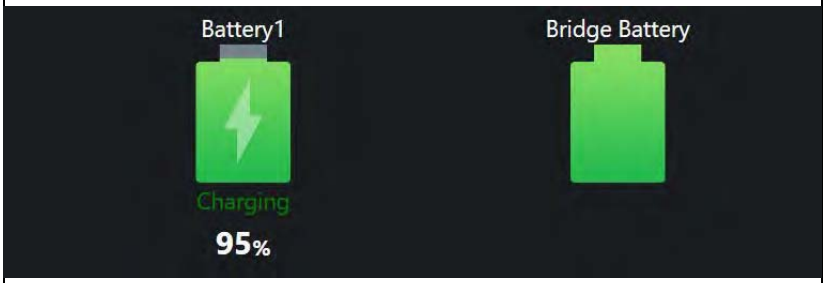
Tablets maintain a low-level of power consumption while turned-on, including when in Sleep mode. To conserve battery power, turn off the tablet when not in use.

12.4.1 Battery Status

The tablet Dashboard function (Section 11.2) reports the status of the Main Battery and the Bridge Battery. To access this data:

1. Open the Dashboard utility using the normal methods (Section 11.2).
2. Tap the **Status** button. The Status screen opens. At the top of the screen, the Battery section displays color and text status data.

Table 12-1: Dashboard Status: Battery Listings

Meaning	Typical Image
Main Battery Charged (connected to AC power), does not recharge starting above 95% charge Bridge Battery Charged	
Main Battery Charging (connected to AC power), charging starts when less than 95% charge Bridge Battery Charged	
Main Battery Discharging (disconnected from AC power), Bridge Battery Charged; Battery will shut down with about 1% remaining, to save enough power for restart	
Main Battery removed (disconnected from AC power), Bridge Battery Status Does not Change Tablet enters Sleep mode after 1 minute, screen goes dark. Tablet will save data to solid state drive, if sufficient charge in the Bridge Battery	

12.4.2 Main Battery Pack Recalibration

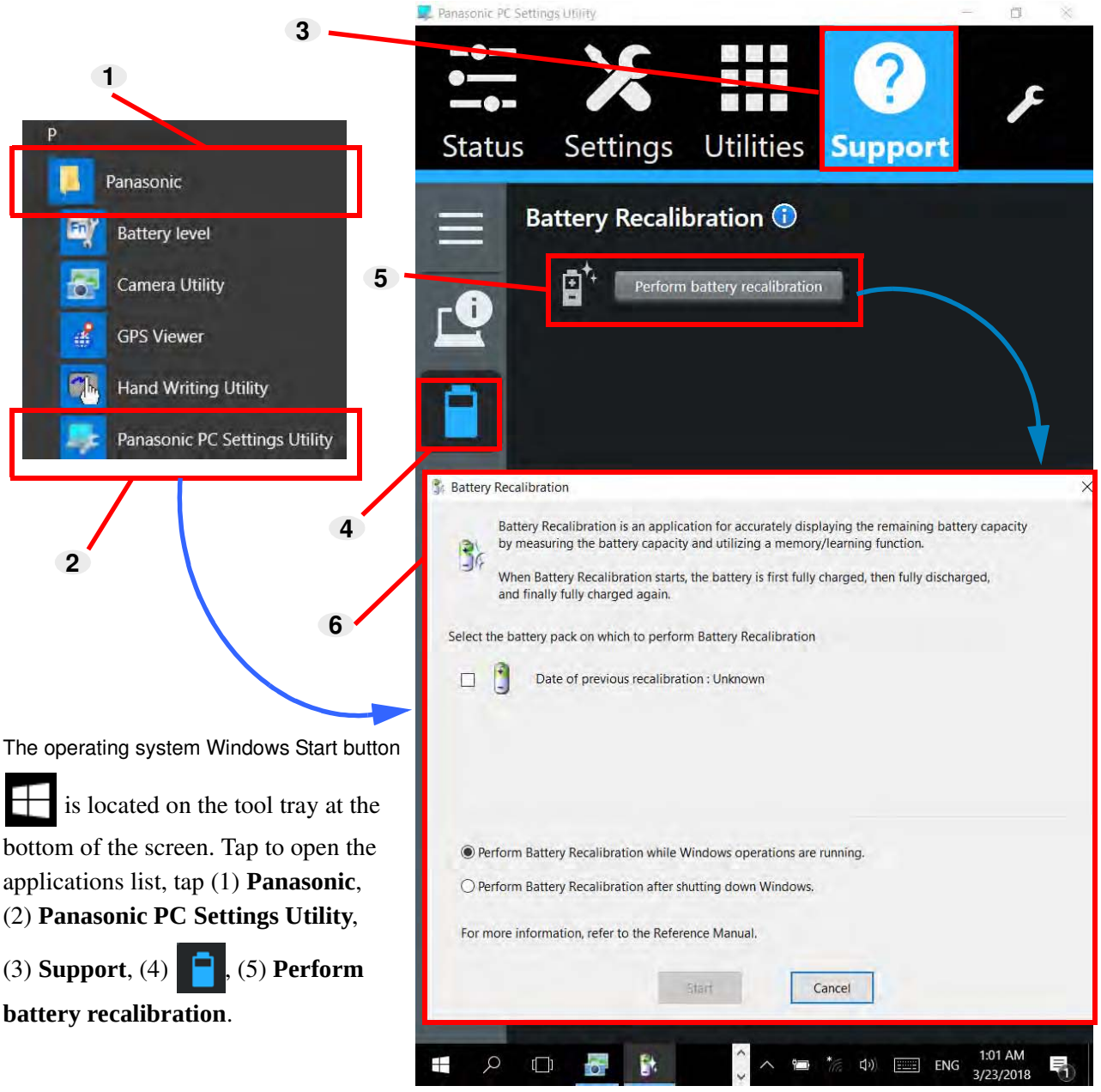
The tablet has a built-in battery recalibration procedure. Battery recalibration is a common feature of smart batteries, in which the battery is retaught where the fully charged and the zero charge power levels are, so it can accurately report the relative level of power remaining during normal operation. A common symptom requiring battery recalibration is the battery reporting an ample level of charge remaining, and then in a short time reporting zero charge and shutting down. This loss of accurate reporting can occur after many recharge cycles.

Battery recalibration is accessed by a supervisor login account. To perform a battery recalibration:

1. Ensure the tablet AC power adapter is connected and supplying power.
2. Enter the Windows operating system (Section 3.7.1).
3. To open the **Panasonic PC Settings Utility** (Figure 12-2) (shortcut: press the "A" button 

on the side of the tablet):
   a. At the bottom of the Windows Desktop screen, a tool bar appears.

   b. Tap the Windows Start button  . A menu appears.
   c. Flick up until the **Panasonic** folder appears. Tap the button to open the folder.
   d. Tap the **Panasonic PC Settings Utility** button (this opens the operating system version of the Dashboard, Figure 12-2).
4. Tap **Support** >  > **Perform Battery Recalibration**. The **Battery Recalibration** subscreen opens.
5. Select recalibration parameters, then tap the **Start** button.
   - Only the Main Battery pack is monitored by this function, so tap to select the only check box in the **Select the battery pack**… option group.
   - Tap the radio button to select whether to run recalibration during Windows operations, or after Windows applications have been shut down. The built-in recalibration function runs more quickly after Windows has shut down, but in either case, adequate time should be allowed for the procedure to run to completion before powering off the tablet. Complete charge occurs based from the level of charge at the time the recalibration begins, then complete discharge takes approximately 5 hours, and finally, complete recharge takes about 2.5 hours. If the tablet is shut down prematurely and an error message appears, cycle power to the tablet and try again.



The operating system Windows Start button is located on the tool tray at the bottom of the screen. Tap to open the applications list, tap (1) **Panasonic**, (2) **Panasonic PC Settings Utility**, (3) **Support**, (4) , (5) **Perform battery recalibration**.

Figure 12-2: Dashboard (Panasonic PC Settings Utility) Battery Recalibration Settings.

12.4.3 Loading and Unloading the Tablet Main Battery

The main battery pack is loaded for charging the main battery pack, and for use in powering the tablet.

CAUTION

Do not touch the terminals and prevent dust or water from reaching the tablet socket or battery terminals while loading and unloading the battery.

Always disconnect the AC power supply before loading or unloading the main battery.

Do not install or remove the battery pack while the tablet is in Sleep mode. Removal of the battery pack in Sleep mode causes unsaved data to be lost and can cause the tablet to malfunction.

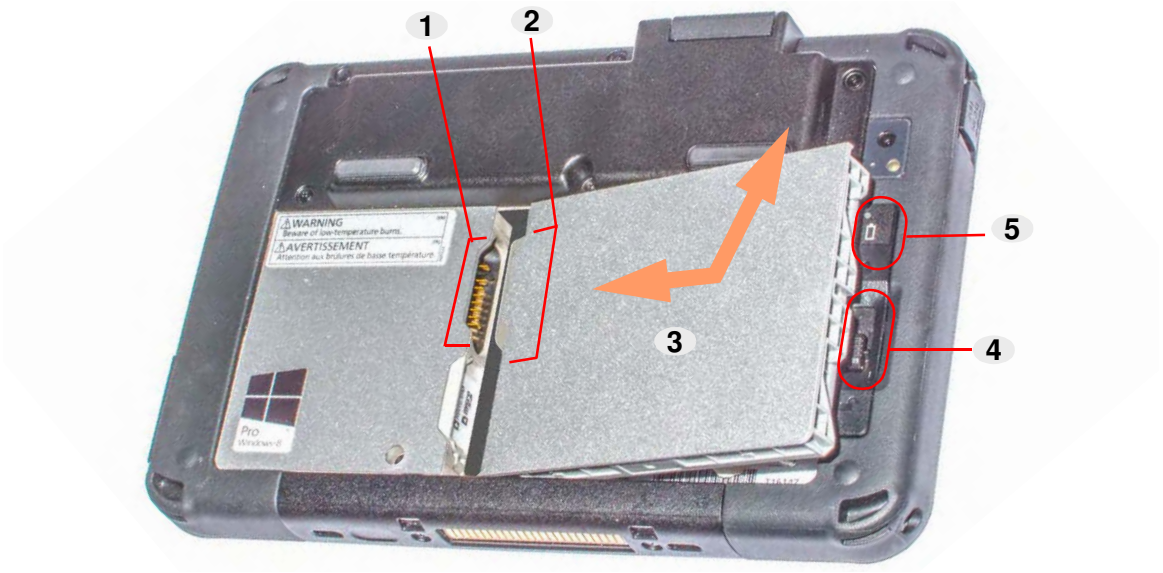


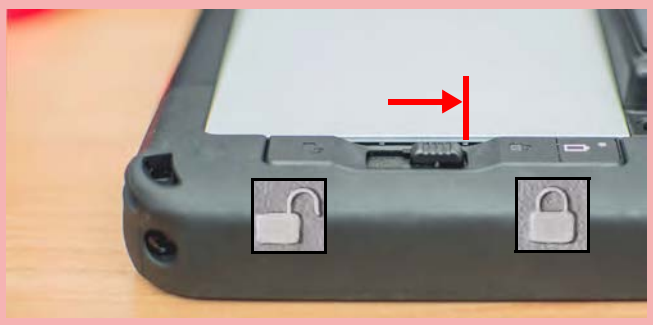
Figure 12-3: Main Battery Pack Access. (1) Tablet Main Battery socket, (2) Main Battery Pack plug, (3) Main Battery Pack, (4) Main Battery Latch Slider, and (5) Hot Swap status LED.

- To load the main battery pack:

1. Ensure that the AC power supply is disconnected from the tablet.
2. On the back of the tablet, orient the battery with the label down, and the electrical contacts near the center of the tablet, then connect the contacts into the socket on the tablet.

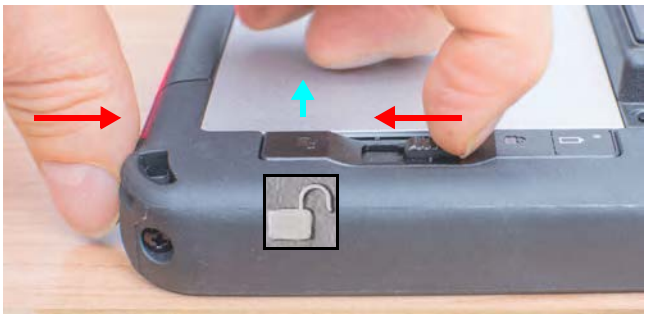
3. Press down on both raised corners of the battery pack, until the battery latch slider springs into the locked position.

When the main battery pack is loaded, always ensure that the slide latch is fully engaged, to prevent the battery falling out.

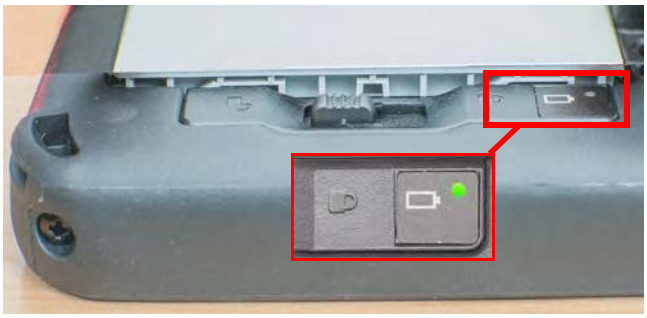


- To unload the main battery pack:

1. Ensure that the AC power supply is disconnected from the tablet.
2. Consider saving all data or powering-down the tablet.
3. Squeeze the battery latch slider to move it to the unlock position (do not push down—it will lock to prevent accidental release). The battery pops up, but does not disconnect.



4. If the tablet is powered, the Hot Swap indicator light illuminates to show status.



5. If the Hot Swap Indicator is green, or if it is not illuminated, removing the battery should be safe, without losing data.
   If the LED is flashing red, the bridge battery cannot support hot-swapping at this time. Press the battery back down into the tablet to re-latch the slider, save all data, and power-down the tablet completely; then remove the battery pack.

12.4.4 Hot-Swapping

An LED indicator of the tablet availability for hot-swapping is located on the back of the tablet, next to the main battery latch.This light indicates whether a hot-swap would be successful, without the loss of data. The light can change status based on the charge level of the Bridge battery, connection state of the AC adapter, the connection state main battery pack, the state of the battery pack lock slider, and the state of the tablet software (Sleep mode or not).

This feature should be tested and used with caution to avoid loss of data in the tablet main memory. In general, if the LED changes to flashing red when the main battery latch is unlocked, do not disconnect or remove the battery. Re-lock the battery and do not attempt a hot-swap. A typical cause is insufficient charge in the Bridge battery.

AS&E is not responsible for any loss of data from hot-swapping the main battery pack.

12.4.5 Tablet Main Battery Pack Status LED

The status of battery charging is indicated in the touchscreen by the Battery Status LED indicator  .

The states are:

- Off – normal operation on battery power.

- Green steadily – fully charged
- Yellow steadily – charging
- Yellow blinking – not charging, battery temperature out of range
- Yellow and green blinking alternately – solid state drive temperature is low; and tablet is warming it before starting normal operation
- Red – less than 10% charge remaining
- Red blinking – error

12.4.6 Checking the Tablet Main Battery Pack Level

The tablet typically has an operation period of up to 8-9 hours on a fully charged battery. The actual duration depends on factors such as the temperature of the working environment, the interconnect method, the duty cycle of scanning, the quantity of times the battery has been recharged in the past, and the length of time the tablet is powered-on per operating session. Checking the power level periodically helps to ensure that the source is not depleted unexpectedly.

To check the level of charge of the tablet embedded battery, perform the following steps:

1. On any screen, in the lower corner, the Status button appears . Tap the button to open the Status screens.
2. Open the **Details** screen (see Figure 5-10) (if not already open): in the top corner, tap the **Details** button.
3. In the **Details** screen, the tablet power status is shown as a percentage in the **Tablet** table, **Battery Charge Level** row. (Do not confuse with the **Scanner** table **Battery Charge Level** row.)

If the battery pack will not be used for a long period of time (a month or more), charge or discharge (use) the main battery pack until the remaining battery level becomes 30% to 40% and remove the main battery pack and store it in a cool, dry place.

The computer consumes power, even when fully powered-off, and when in Sleep mode

12.4.7 Recharging the Tablet Main Battery Pack

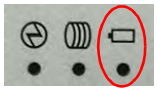
The main battery pack is charged while the pack is installed in the tablet. To recharge the tablet main battery pack, use the external AC adapter from the tablet manufacturer, (see Figure 12-4).

Figure 12-4: Tablet Charger. (1) AC adapter, (2) Plug (to tablet), (3) Power cord (between AC adapter and mains).

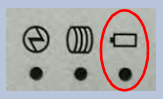
To recharge the tablet main battery pack, perform the following steps:

1. Optionally, power-off the tablet to reduce recharge time.
2. Insert the main battery pack, as described in Section 12.4.3.
3. Connect the power cord to the AC adapter.
4. Insert the AC adapter cable plug into the tablet DC IN charge port on the side of the tablet.

5. Connect the power cord to an appropriate power source (see Table A-2). The tablet begins to charge, indicated by the yellow LED on the touchscreen. When charging is complete, the LED displays green.



The AC adapter has an internal circuit protection feature. If the battery indicator light (circled, at right) on the touchscreen does not illuminate when the AC adapter is connected properly, the problem may be the protection circuit. To reset, unplug the cable from the tablet DC IN port, wait one minute, and then plug in again.



The battery does not charge when the internal battery temperature is not within the specification range (see Table A-2).

6. During charging, the tablet can be used to check the level of charge (see Section 12.4.6, Checking the Tablet Main Battery Pack Level).
7. When charging is complete, disconnect the AC adapter from the mains power supply, then disconnect the AC adapter cable from the DC IN charge port.

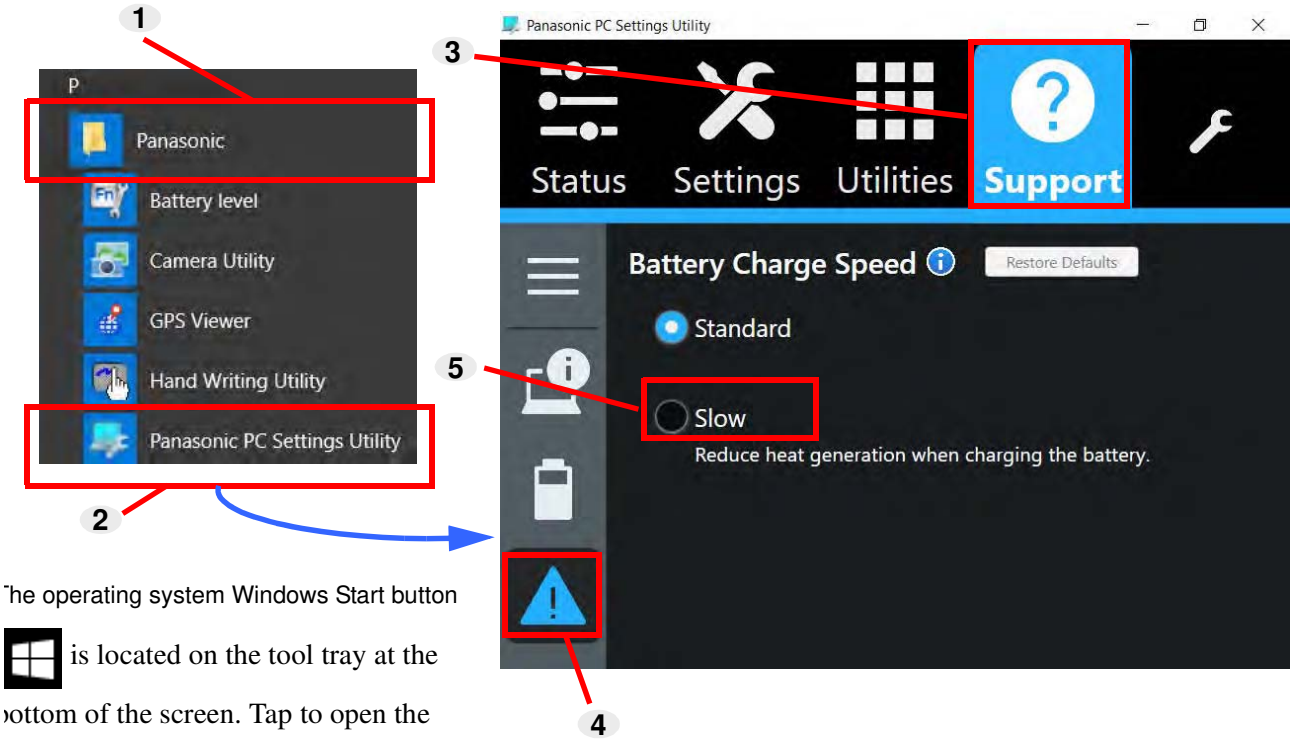
12.4.8 Recharge Rate

The main battery pack can become hot during recharging. The rate of recharge can be set lower if desired, to reduce the temperature. Rate adjustment is accessed by a supervisor login account. To perform a battery recharge rate adjustment:

1. Enter the Windows operating system (Section 3.7.1).
2. To open the **Panasonic PC Settings Utility** (Figure 12-5) (shortcut: press the "A" button  on the side of the tablet):
   a. At the bottom of the Windows Desktop screen, a tool bar appears.

   b. Tap the Windows Start button  . A menu appears.
   c. Flick up until the **Panasonic** folder appears. Tap the button to open the folder.
   d. Tap the **Panasonic PC Settings Utility** button (this opens the operating system version of the Dashboard, Figure 12-5).
3. Tap **Support** >  . The **Battery Charge Speed** screen opens.

4. Tap the **Slow** radio button to reduce the heat generation level.



The operating system Windows Start button is located on the tool tray at the bottom of the screen. Tap to open the applications list, tap (1) **Panasonic**, 2) **Panasonic PC Settings Utility**, 3) **Support**, (4) .

Figure 12-5: Dashboard (Panasonic PC Settings Utility) Battery Recharge Rate Settings.

12.4.9 Bridge Battery

The tablet is equipped with a separate, embedded lithium-polymer bridge battery that maintains system power while the main battery pack is being replaced ("hot-swapped"). At full charge, it is rated for only one minute of operation during a battery hot-swap, and it may not be fully charged when the change is to be performed, so the replacement battery should be prepared and charged if the bridge battery is to be used.

The tablet manufacturer recommends fully recharging the bridge battery once every 12 months to prevent deterioration of the battery. To recharge the bridge battery:

1. Power-off the tablet.
2. Remove the main battery pack.
3. Connect the tablet to the AC power adapter.
4. Charge the bridge battery for approximately 2 hours continuously.

CAUTION

Strong magnetic fields can cause the bridge battery to malfunction.

12.5 Scanner Battery

The scanner Lithium-Ion battery is mounted inside the scanner housing at the rear bottom edge. It is accessed via a tethered cover (see Figure 12-6). The battery is removable, allowing the user to exchange discharged batteries. The battery must be removed for recharging.

Figure 12-6: Scanner Battery Access. (1) scanner housing (rear view), (2) battery compartment (open), (3) tethered cover, (4) battery with (5) alignment groove, and (6) flexible tab (for removing battery from compartment). Inset (7) shows the LCD display for state-of-charge (five segments showing steady color indicates 100% charge).

WARNING

The scanner unit has a micro data card, accessible in the battery bay (Figure 12-7). This card contains configuration data for the unique scanner unit. Never remove or exchange that data card, except with direct instructions from AS&E, such as for firmware updates.

12.5.1 Checking the Scanner Battery Level

There are three methods for checking the state of charge of the scanner battery. During operation, the state of charge of the scanner battery can be checked on the tablet or on the scanner, as described in this section. The battery charger also provides status while the battery is docked (see Section 12.5.3.1, Charger Status LEDs).

On the tablet:

- For an approximate reading of scanner battery charge level, on any screen (when the scanner is connected) in the Status bar at the bottom of the screen, a battery icon appears . The proportion of the icon that is filled with color approximates the state of charge of the scanner battery. If the level of charge drops below 15% of full charge, the icon changes to red and flashes .
- For a precise reading of scanner battery charge level, perform the following steps:
  a. On any screen, in the lower corner, the Status button appears . Tap the button to open the Status screens.
  b. Open the **Details** screen (see Figure 5-10) (if not already open): in the top corner, tap the **Details** button.
  c. In the Details screen, the scanner battery status is shown as a percentage in the **Scanner** table, **Battery Charge Level** row. (Do not confuse with the **Tablet** table Battery Charge Level row.)

On the scanner:

- For an alert reading of scanner battery charge level, when the state-of-charge of the scanner battery reaches 15% of full, the Power LED (on the upper surface of the scanner housing, towards the front of the scanner, see Table 4-2) flashes green. When the charge is greater than 15% of full, the Power LED stays steady green.
- For an approximate reading of the scanner battery charge level, perform the following steps (refer to Figure 12-6):

CAUTION

The scanner battery compartment cover is attached to the scanner housing by a tether cord. Be careful not to break the cord when removing the cover.

  a. At the rear bottom edge of the scanner housing, gently remove the tethered cover of the battery compartment.
  b. On the exposed surface of the battery, view the LCD display (it is not necessary to remove the battery from the compartment). It consists of up to five segments, cumulatively indicating the sate-of-charge, with each segment indicating a 20% charge (all five segments showing steadily indicates 100% charge).
  c. Reclose the cover of the battery compartment.

12.5.2 Exchanging Batteries in the Scanner

Always exchange with a fully charged battery originally provided with the system (see Section A-1, Scanner Specifications). Batteries should be checked for damage or misuse before being installed in the system. Weak batteries that are unable to hold a complete charge should be replaced by a new battery.

Consider always having the spare battery provided with the system on hand and fully charged, so that the batteries can be exchanged.

To exchange scanner batteries, perform the following steps (refer to Figure 12-6):

CAUTION

The scanner battery compartment cover is attached to the scanner housing by a tether cord. Be careful not to break the cord when removing the cover.

1. On the top surface of the scanner, turn the key to the Off position (“O”). The Power and Status LEDs on the scanner housing extinguish.
2. Exchange batteries:
   a. At the rear bottom edge of the scanner housing, gently remove the tethered cover of the battery compartment.
   b. Remove the discharged battery by pulling the battery flexible tab straight out from the battery compartment.
   c. Align a fully-charged battery with the alignment groove facing upwards and the LCD state-of-charge display facing away from the scanner.
   d. Gently push the battery into the battery compartment, using finger pressure. Ensure that the battery jacks fully seat over the connection tines inside of the battery compartment. (Similar tines are shown in Figure 12-8.)
   e. Reinstall the cover of the battery compartment.

To confirm the battery is properly installed, on the top surface of the scanner, turn the key to the On position (“|”). The Power LED on the scanner housing should turn steady green.

After the battery has been changed, if WiFi communication is being used, the WiFi link to the tablet must be reestablished. See.Section 3.6.3.

After changing a scanner battery, if the scanner system turns on (green LED), but will not seek (blinking yellow light), check in the battery compartment, and make sure the micro data card is fully inserted (Figure 12-7).

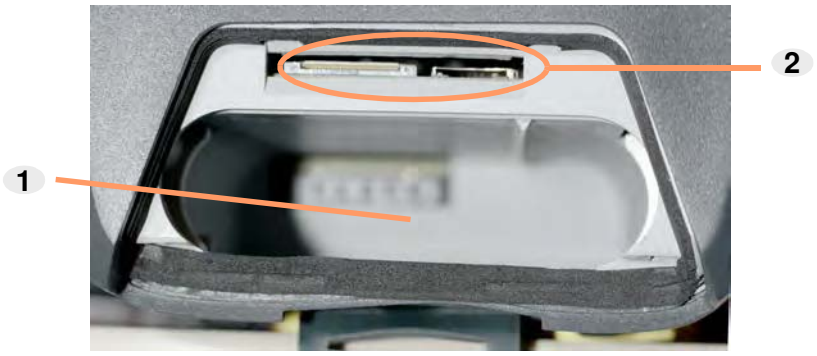


Figure 12-7: Micro Data Card Slots. (1) Battery compartment (open and empty), (2) micro data cards slots. Be careful not to spring out the micro data card when changing the battery.

12.5.3 Recharging the Scanner Battery

To recharge the battery, it must be disconnected and removed from the scanner battery compartment, and then connected to the external charger that is provided with the system. The charger is shown in Figure 12-8.

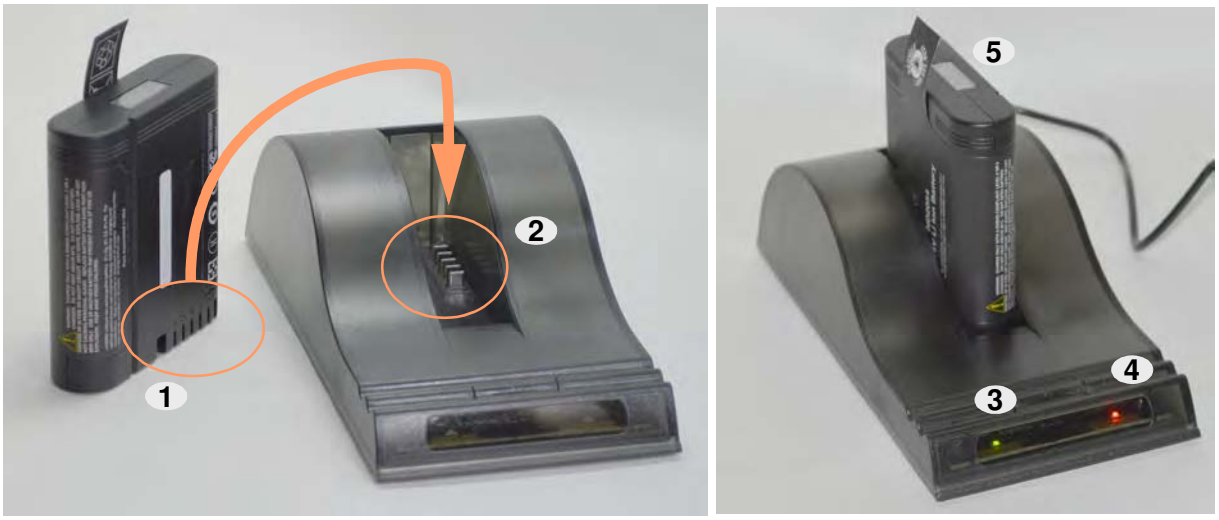


Figure 12-8: Scanner Battery Mounting in Charger. Left: battery aligned: (1) 5-jack connector on battery, (2) 5-tine connector in charger battery bay. Right: battery mounted: (3) battery status LED, (4) charger status LED, (5) LCD display for state-of-charge.

12.5.3.1 Charger Status LEDs

Two status LEDs are visible through the front cover of the charger (see Figure 12-8). These are enabled only when a battery is fully seated in the charger battery bay, and the charger is powered-on.

- Battery Status, green (left):
  - flashing – battery is charging
  - steady – battery is fully charged
- Charger Status, red (right):
  - flashing – recalibration required
  - steady – error in charging

Battery recalibration is a common feature of smart batteries, in which the battery is retaught where the fully charged and the zero charge power levels are, so it can accurately report the relative level of power remaining during normal operation. A common symptom requiring battery recalibration is the battery reporting an ample level of charge remaining, and then in a short time reporting zero charge and shutting down. This loss of accurate reporting can occur after many recharge cycles. Recalibrating involves a complete discharge, followed by a complete recharge, without use during the process.

12.5.3.2 Connecting the Charger

The charger comes along with an AC adapter and separate power cords with connectors for USA, UK, and Europe mains systems.

The charger system includes three small plastic spacers. These are not required for the battery provided with this system.

Figure 12-9: Scanner Battery Charger Setup. (1) one of three power cords (European, USA, and UK mains plugs), (2) AC adapter (3) charger.

Figure 12-10: Scanner Battery Charger Power Cable Options. (1) European mains, (2) USA mains, and (3) UK mains.

CAUTION

The charger is an open system, and the following cautions should be observed:

- Do not expose the charger or the AC adapter to liquids
- Do not open the charger or the AC adapter
- Do not restrict the airflow around the charger and the vent
- Use only the supplied AC adapter
- Use in a cool area, away from external sources of heat

1. Connect the AC adapter to the charger.
2. Select the power cord appropriate to the local power mains (Figure 12-10), and connect it to the AC adapter.
3. Connect the power cord to an appropriate power source (see Section A-1, Scanner Specifications).

12.5.3.3 Charge the Scanner Battery

After connecting the charger, as described in Section 12.5.3.2, Connecting the Charger, charge the scanner battery as follows:

1. To check the recycle charges of a scanner battery:
   a. In the tablet, in any screen, tap the Status button in the lower corner of the screen. A Status screen opens.
   b. In the top corner of the screen, tap the **Details** button. The Status Details Mode Screen opens.
   c. In the **Battery Cycles** row, verify that the recharge cycle count is acceptable.
2. Power-down the scanner and remove the battery from the scanner battery compartment, as described in Section 12.5.2, Exchanging Batteries in the Scanner.
3. Connect the battery charger.
4. Insert the depleted battery in the charger battery bay (see Figure 12-8). The battery begins to charge if the state of charge of less than 90% of full charge. Both charger status LEDs flash, and then the Status (left) LED turns flashing green while charging occurs.
5. Observe the battery LCD display for the progress of the recharge (refer to Figure 12-8).
6. When the Battery Status LED on the charger turns solid green, the battery is fully charged. Remove the battery.
7. Repeat to charge other batteries, otherwise, disconnect the charger assembly from the power mains.

Chapter

13 Options and Accessories

This chapter describes major options available for a MINI Z™ system.

For the latest information on available options, contact AS&E.

13.1 System Parts List

The MINI Z is shipped in a Rugged Transport Case, along with any options and accessories that may have been ordered. Table 13-1 provides a list of the standard parts and options. Compare the packing list to the contents of the shipment to determine which items are included.

Table 13-1: Parts List for MINI Z System

Item Part Number	Quantity and Description	Image
342-0500	MINI Z System	
	Tablet (with protective case installed), charger, and power cable; hand grip, and stylus with tether cord	  
	ASEInspection software	(Installed)

Table 13-1: Parts List for MINI Z System (continued)

Item Part Number	Quantity and Description	Image
Scanner		
	Handheld Module, Bx standard 120kV, with included power switch key	
	Handheld Module, future option	
	Cable Assembly (Long) M12 to Ethernet (RJ45)	
	Scanner shoulder strap	

Table 13-1: Parts List for MINI Z System (continued)

Item Part Number	Quantity and Description	Image
	Rugged transport case	
	Scanner battery (2) with contact caps	
	Scanner Battery Charger with US power cord	

Table 13-1: Parts List for MINI Z System (continued)

Item Part Number	Quantity and Description	Image
	Scanner Battery Charger EU power cord	
	Scanner Battery Charger UK Power cord	

Table 13-1: Parts List for MINI Z System (continued)

Item Part Number	Quantity and Description	Image
	Soft case (backpack, with modified padding)	
342-1406-1	Calibration Dock (Phantom Wire); Black frame, rated for 120kV	

13.2 Tablet Anti-Virus Updating

The tablet supports the Microsoft® Windows® Defender Web-based utility to update the anti-virus definitions for the tablet software. This procedure allows supervisor-level user accounts to download and install the virus definitions and also to install the functionality to check for viruses on USB drives that may be connected for transferring files.

13.2.1 Updating Windows Defender Virus Definitions

13.2.1.1 Preparation

1. The scanner unit is not required for this procedure.
2. The tablet Windows operating system password is required.

It is recommended that a supervisor account change the Windows password when the tablet is initially configured. That password should be available. If the Windows password was not changed from the default, the default password, **asepassword**, should be operable. After the completion of this procedure, the default password be changed to a confidential password.

3. Locate the tablet near a trusted WiFi node with a strong WiFi signal.
4. If the trusted WiFi network requires a password, get the password.
5. Connect the AC power adapter to the DC IN port at the bottom of the tablet, and using the power cord, then connect the power adapter to an appropriate mains power source.

The download and installation process can take a significant amount of time, depending on factors such as the quality of the available Internet connection. It is recommended that the tablet be connected directly to a mains power source during the entire procedure rather than risk the battery being drained of charge in the midst of the procedure.

6. On the side of the tablet, press and momentarily hold the Power button  . The tablet powers up and opens ASEI.
7. Access the Windows operating system (Section 3.7.1).
8. If Airplane Mode is engaged to prevent the use of WiFi, perform the following steps to disable Airplane mode so WiFi can be used. Otherwise skip to step 9:
   a. At the bottom of the screen, a menu appears. If Airplane Mode is enabled, an airplane symbol appears  .
   b. Tap the symbol to open a menu. Tap the Airplane mode button in this menu to disable Airplane mode. Tap the WiFi button to enable it if it is not already enabled (blue background). The sym-

bol changes to the Networks symbol  . An d the menu updates to show the available WiFi nodes.

9. If the SSID of the desired network does not appear, move to a location where the signal is available, and try again.
10. Tap the listing for the trusted WiFi network. A subscreen appears.
11. To prevent the tablet from reestablishing this connection without authorization, tap to clear the checkbox **Connect automatically**. (Allowing automatic connection may interfere with establishing connections to MINI Z scanner units during normal operations.)
12. To establish this connection, tap the **Connect** button.
13. Windows verifies the network security. This process depends on the local WiFi network. The Windows desktop opens.

13.2.1.2 Downloading Virus Definitions from Defender

1. Tap the tool tray Windows Start button  . A menu opens.
2. Tap **S** > **Windows System** > **Windows Defender**. The Windows Defender Web page opens.
3. Follow the instructions to activate protection and to update the anti-virus definitions.

13.2.1.3 Restoring Normal Tablet Operation

It is recommended that a supervisor account change the Windows default password to a confidential password.

1. To prevent the use of WiFi, perform the following steps, otherwise skip to step 2:
   a. Tap the Airplane Mode button accessed as above. The button changes to an airplane symbol  , indicating that Airplane Mode is in effect and WiFi is disabled.
2. Tap the Windows tool tray button  . A menu appears.
   a. In the touchscreen, tap the **Power** button  . A shortcut menu opens.
   b. Tap the option **Restart**. The tablet restarts and opens into ASEInspection.

This procedure is complete. It can be repeated at any time.

Appendix

A Specifications

A.1 Specifications

Table A-1: Scanner Specifications

Dimensions:
Length: 11.5 in. (29.2 cm)
Width: 9.8 in. (24.9 cm)
Height: 7.5 in. (19.3 cm)
Weight: 9.2 lbs. (4.2 kg)
Operating Time: 4 hrs. per battery charge (typical, based on 25% duty cycle)
Scan speed: 6 in. (15 cm) per second (typical)
Operating Environment: IP 54 rated
Ambient Operating Temperature: 0^{o}C to 45^{o}C (32^{o}F to 113^{o}F)
Storage Temperature: -40^{o}C to 60^{o}C (-40^{o}F to 140^{o}F)
Elevation:
System operation 0 to 10,000 ft. (3000 m).
System shipping up to 15,000 ft. (4500 m) pressurization equivalent.
Warm up:
Off less than 12 hrs. – not required
Off more than 12 hrs. – 25 seconds
Charging Power:
Voltage: Input 100 VAC – 240 VAC, 50/60 Hz
Current: Input 1.4 A Max.
Battery: Li-ion

Table A-2: Tablet Specifications

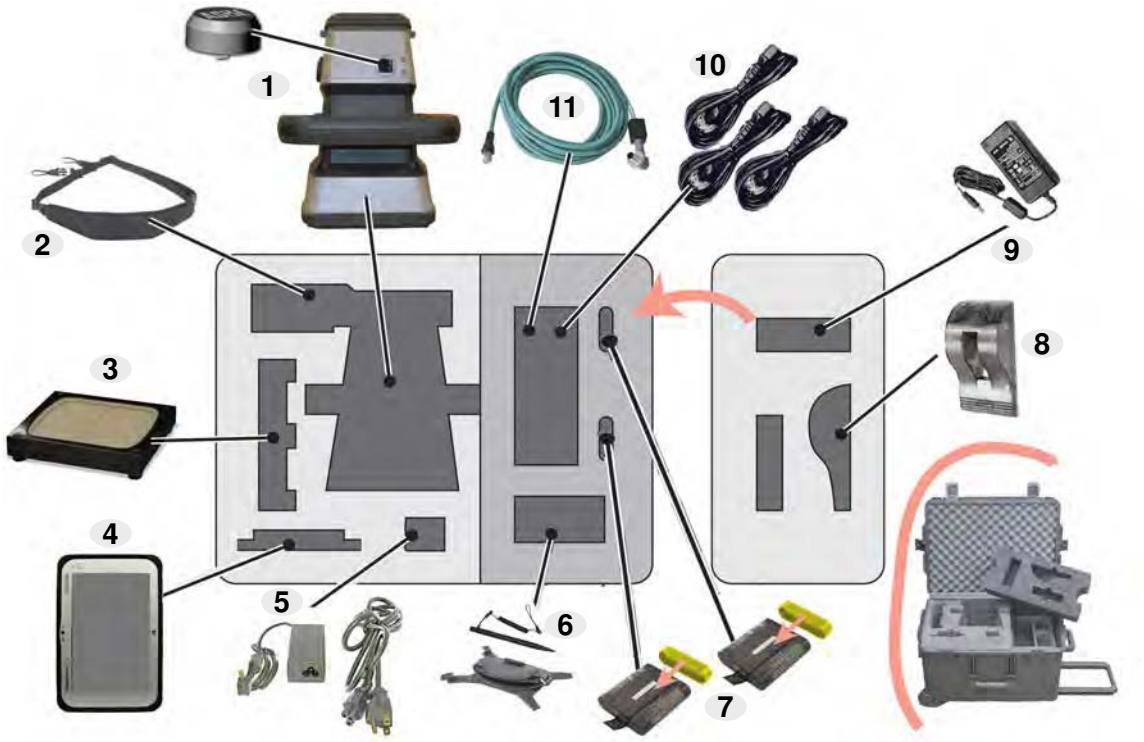
Identification:
Panasonic® Toughpad Model FZ-M1
Serial Number is located under the main battery
Display: 7-in diagonal WXGA Gloved Multi Touch LCD touch screen

Table A-2: Tablet Specifications (continued)

Base OS: Windows 8.1 Pro 64-bit
Storage: 256 GB Solid State Drive (SSD) base, with reserved partitions; microSDXC and micro SIM compatible slots; USB 3.0 port; 3.5mm headphone jack 32 Ohm impedance 4mW output stereo, monaural microphone
Interface: USB port 3.0, LAN port RJ-45, WiFi IEEE802.11ac / IEEE802.11a / IEEE802.11n: Channels 36/40/44/48/52/56/60/64/100/104/108/112/116/120/124/128/132/136/140/149/153/157/161/165; IEEE802.11b / IEEE802.11g / IEEE802.11n: Channels 1 to 11; WiFi 24.GHz and 5.0GHz selectable
Operating/Recharge Time: Approximately 8 hours (usage dependent, shorter in low temperatures) /Approximately 2.5 hours (power off, ambient temperature above 10°C [50°F]) With power off, discharges in approximately 6 weeks; in Sleep mode, discharges in approximately 9 days
Ambient Operating Temperature and Relative Humidity: –10°C to 50°C (14°F to 122°F) 30% to 80% RH (No condensation); Battery recharge enabled for internal: 0°C to 50°C (32°F to 122°F), high ambient temperature derating function
Storage Temperature and Relative Humidity: –20°C to 60°C (–4°F to 140°F) 30% to 90% RH (No condensation)
Do not operate in extreme temperature, wet, smoky or dusty environments. Do not drop or hit against hard objects. Do not hold by the touchscreen, do not use objects other than a finger to contact or apply pressure on the touchscreen. Operation of sensors: acceleration, gyro, magnetic, and light depend on the operating conditions. Included bridge batterys: do not operate in strong magnetic field.
Adapter Charging Power:
Input: 100 VAC – 240 VAC, 50/60 Hz; North America supplied cord 125 VAC, 10 A rated
Output to Tablet: 16 VDC, 3.75 A Max., center positive coaxial male plug
Main Battery: Li-ion, Bridge Battery: Li-Polymer, Clock battery: Li

A.2 Shipping Case Packing

Table A-3: Shipping Case Packing



1. Scanner with Scanner key
2. Scanner Shoulder Strap
3. Calibration Dock
4. Tablet
5. Tablet power adapter with power cord
6. Tablet Stylus and Hand Grip
7. Scanner batteries (2), with contact covers
8. Scanner battery charger
9. Scanner battery charger power adapter and cord
10. Scanner battery charger cords for USA, UK, and EU
11. Ethernet cable

(Figure repeats **Figure 11-2**.)

A.3 Fault and Warning Messages

Table A-4: Fault and Warning Messages

Fault or Warning Text	Description
12V power fault [Fault]	The scanner has insufficient internal power supply (not likely the result of a depleted scanner battery), and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
5V power fault [Fault]	The scanner has an internal power regulation fault. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
Battery critical [Fault]	There are two scanner battery thresholds for level of charge. When the scanner battery charge has depleted to the second threshold, less than 2% of full charge, the scanner X-ray generation stages are shut down as a precaution to avoid damage to the battery and this message is displayed. Turn the key off and replace the scanner battery with a fully charged battery, then restart the scanner. (Place the depleted battery in the scanner battery recharger and check the battery status. Recharge the battery if it is capable.) If the fault condition persists, turn the key off and contact AS&E.
Board over temperature [Fault]	A scanner electronic component is too hot and the scanner X-ray generation stages are shut down as a precaution. The user should suspend scanning for a period of time until the system temperature decreases. Turn the key off to accelerate cooling. Restart when the system has cooled. If the fault condition persists, turn the key switch off and contact AS&E.
Collimator interlock fault [Fault]	A component in the X-Ray generation system has become disconnected, and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
Enclosure interlock fault [Fault]	A component of the scanner housing has become disconnected, and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
Failed to backup...image(s) [Warning]	The system was unable to backup some or all of the images selected. Verify that the target storage device is connected and has sufficient free space to accept image data.
Failed to copy image [Warning]	The system was unable to copy some or all of the images selected. Verify that the target storage device is connected and has sufficient free space to accept image data.
Failed to create incident report [Warning]	The system was unable to create the compressed or to transfer the compressed file to an external storage device. Verify that the target storage device is connected and has sufficient free space to accept the incident report file.
Failed to restore...image(s) [Warning]	The system was unable to copy some or all of the image data. Verify that the source storage device is connected and the source data is intact.

Table A-4: Fault and Warning Messages (continued)

Image export failed [Warning]	The system was unable to convert the current image to JPG file format or was unable to transfer the resulting JPG file to an external storage device. Verify that the target storage device is connected and has sufficient free space to accept the s.
Interlock fault [Fault]	The interlock sensing mechanism has a fault, and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
Light leak [Fault]	Ambient light is entering the detection elements, blanking the elements, and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
Motor control fault [Fault]	The scanner motor controller has a fault, and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
Motor speed fault [Fault]	The re are two speed tolerance thresholds for scanner motor speed. When the scanner motor reaches the second limit, 20% either too fast or too slow, and a scan is attempted, this fault message is displayed, and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
Motor speed too fast or too slow [Warning]	There are two speed tolerance thresholds for scanner motor speed. When the scanner reaches the first limit, 10% either too fast or too slow, this warning message is displayed (image quality may be degraded). This warning clears when the scanner enters Standby mode.The user should suspend scanning operation until the motor speed returns to the normal range.
PMT high voltage fault [Fault]	A component in the X-Ray detection system has an error, and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
Power LED fault [Fault]	Indicates that the Power LED (located on the scanner housing) is being supplied by current that is either too high or too low, and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
Scanner battery low [Warning]	There are two scanner battery thresholds for level of charge. When the scanner battery charge has depleted to the first threshold, less than 15% of full charge, this message is displayed. Turn the key off and replace the scanner battery with a fully charged battery, then restart the scanner. Place the depleted battery in the scanner battery recharger and check the battery status. Recharge the battery if it is capable.

Table A-4: Fault and Warning Messages (continued)

Scanner fault detected [Fault]	An unspecified fault condition has occurred, and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
Scanner hot [Warning]	There are two thermal thresholds for scanner operating temperature. When the scanner reaches the first limit, a warning message is displayed. The user should suspend scanning for a period of time until the system temperature decreases and the warning message is removed. If the temperature continues to increase and reaches the second limit, the system disables scanning until the system temperature reduces.
Tablet battery low [Warning]	The tablet power level is low, and the user should suspend operations and recharge the tablet.
Tablet disk space low [Warning]	The allocated space for data on the tablet solid state hard drive is nearly full (5% free). The user should suspend operations and clear space for new images by backing up images to an external storage device and deleting those same images from the tablet hard drive.
Trigger stuck on [Fault]	At power on, the initialization test found one or both of the trigger switches on the scanner handle were closed for more than 3 seconds of time, and the power-on sequence is incomplete. Remove any object that may be pressing on either switch button, and press the switches a few times gently to move them. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
X-Ray current error [Fault]	There are two output current thresholds for the scanner X-ray tube. When the scanner output current rises to more than 10% above its target value during scanning, this fault message is displayed, and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
X-Ray current is low [Warning]	There are two output current thresholds for the scanner X-ray tube. When the scanner output current drops more than 10% below its target value during scanning, this warning message is displayed. The user should suspend operation until the output level increases and the warning message is removed.
X-Ray KV error [Fault]	There are two output voltage thresholds for the scanner X-ray tube. When the scanner output voltage rises to more than 10% above its target value during scanning, this fault message is displayed, and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
X-Ray lamp 1 failure [Warning]	One of the two independent “X-ray on” indicator LEDs circuits (referred to as *lamp circuit 1*) had current levels that were 10% too high or too low, and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.

Table A-4: Fault and Warning Messages (continued)

X-Ray lamp 2 failure [Warning]	One of the two independent “X-ray on” indicator LEDs circuits (referred to as *lamp circuit 2*) had current levels that were 10% too high or too low, and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
X-Ray LED fault [Fault]	Both of the “X-ray on” indicator LEDs circuits had current levels that were 10% too high or too low, and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
X-Ray sensor fault [Fault]	The X-ray tube power was on, but the circuit controlling the “X-ray on” indicator LEDs was not on, and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
X-Ray timer [Fault]	The X-ray tube did not turn off after emitting continuously for 30 seconds of time with the trigger switches pressed, and the scanner X-ray generation stages have been automatically shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
X-Ray tube hot [Warning]	There are two temperature thresholds for the scanner X-ray tube. When the scanner temperature rises above the first limit, this warning message is displayed. The user should suspend operation until the temperature decreases and the warning message is removed.
X-Ray tube over temperature [Fault]	There are two temperature thresholds for the scanner X-ray tube. When the scanner temperature rises above the second limit, this fault message is displayed, and the scanner X-ray generation stages are shut down as a precaution. The user should suspend operation until the temperature decreases, then turn the key on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.
X-Ray tube temperature is unknown [Warning]	The sensor that measures the temperature of the X-ray tube is not working.
X-Ray voltage is low [Warning]	There are two output voltage thresholds for the scanner X-ray tube. When the scanner output voltage drops more than 10% below its target value during scanning, this warning message is displayed. The user should suspend operation until the output level increases and the warning message is removed.
X-Rays stuck on [Fault]	The X-ray tube power was on when the X-ray stages had not been enabled, and the scanner X-ray generation stages are shut down as a precaution. Turn the key off and then on again to attempt to reset the scanner. If the fault condition persists, turn the key off and contact AS&E.

A.4 System Screens Sitemap

Figure A-1: Hierarchic Arrangement of Primary Screens

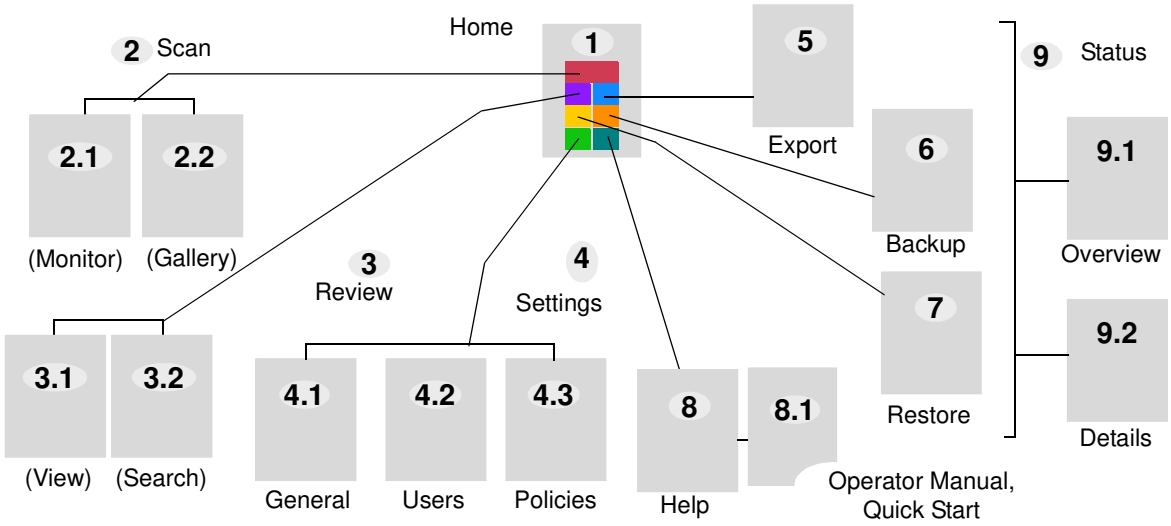
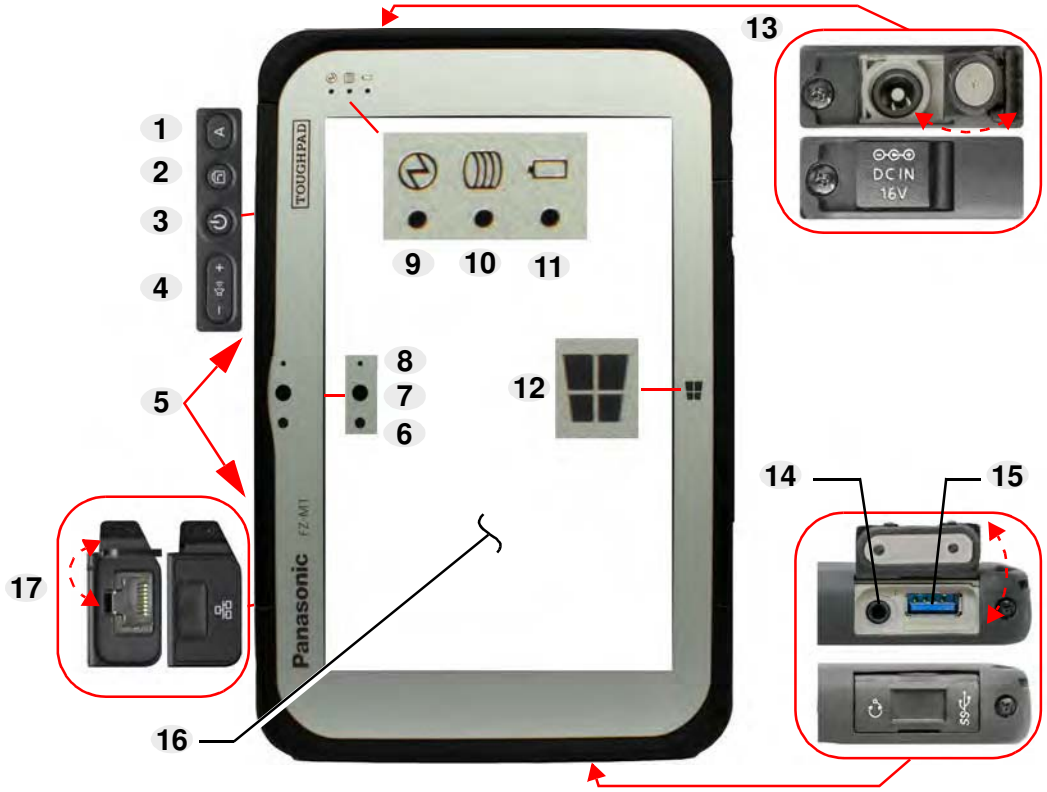


Table A-5: Primary Software Screens

Key	Home Screen Button Name		Function
1	Home Screen		Initial screen, buttons provide access to function screens
2	Scan		
	2.1	Scan Monitor Mode Screen	Enable scanning and view active scan, set group name, export current view images with enhancements
	2.2	Scan Gallery Mode Screen	View thumbnails of scans in current group
3	Review		
	3.1	Review View Mode Screen	Full screen display and enhancement of individual images, export images
	3.2	Review and Delete Search Mode Screen	Search for previous images and groups, optionally delete images
4	Settings		
	4.1	Settings General Mode Screen	Screen appearance, incident reports, language
	4.2	Settings Users Mode Screen	Add and edit user accounts
	4.3	Settings Policies Mode Screen	Set user accounts administrative polices
5	Export Screen		Export multiple full images from tablet memory
6	Backup Screen		Copy images to external storage device
7	Restore Screen		Copy images from external storage device
8	Help		
	8.1	Operator Manual	Open this manual, access Quick Start guide
9	Status		
	9.1	Status Overview Mode Screen	Displays general status, faults, and warnings
	9.2	Status Details Mode Screen	Displays performance parameters in real time, and for supervisor accounts: WiFi region setting and scanner calibration

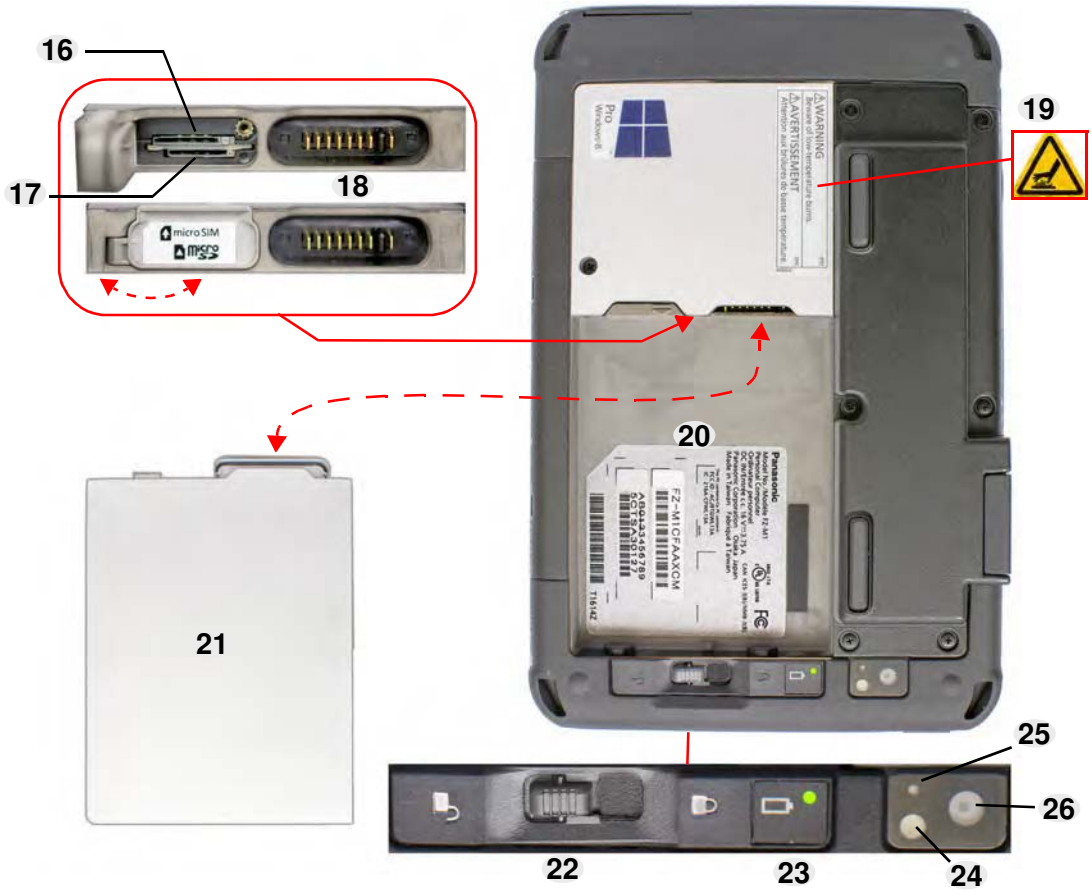
A.5 Tablet Locations

Table A-6: Tablet Front and Side Locations



Front and Side Locations (for rear locations, see **Table A-7**). (1) Dashboard, (2) Screen Rotate Lock, (3) Power, (4) Volume, (5) Microphones, (6) Light Sensor, (7) Front Camera Lens, (8) Camera Status, (9) Power Status, (10) Disk Access, (11) Battery Status, (12) Windows Start, (13) DC In, (14) Headphone, (15) USB Data, (16) Touchscreen, and (17) Ethernet. (Figure repeats **Figure 4-3**. For item descriptions, see **Table 4-3**.)

Table A-7: Tablet Rear Locations



Rear Locations (for front and side locations, see **Table A-6**). (16) microSIM, (17) microSD, (18) Main Battery socket, (19) Tablet manufacturer warning against prolonged contact, (20) Tablet manufacturer model and serial number, (21) Main Battery Pack, (22) Main Battery Lock (unlocked position), (23) Battery Hot Swap Status, (24) Rear Camera Light, (25) Rear Camera Status, and (26) Rear Camera Lens. (Figure repeats **Figure 4-4**. For item descriptions, see **Table 4-3**.)

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