

ZONARE

z.one_{pro} Ultrasound System Service Manual



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The z.one_{pro} Ultrasound System is covered by one or more of the following patents: 6,251,073; 6,569,102; 6,618,206; 6,663,567; 6,685,645; 6,733,455; 6,773,399; 6,866,631; 6,866,632; 6,896,658; 6,936,008; 6,980,419; 6,997,876; 7,022,075; 7,087,020; 7,226,416; 7,238,157; 7,352,570; 7,361,145; 7,510,529; 7,627,386; 7,382,309; 7,699,781; 8,002,705; 8,226,561; D461,814; D462,446; D467,002; D469,539; D469,877

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CAUTION: United States Federal Law restricts this device to sale by or on the order of a licensed physician or licensed veterinarian.

January 2019



For information and pricing on ZONARE system upgrades, transducers, accessories, and new features, please call 1-877-966-2731, ext. 3.

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1 INTRODUCTION

ZONARE Contact Information



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2 PURPOSE

This manual provides information to assist service personnel in performing maintenance, and repair procedures that may be required to support z.one_{pro} Ultrasound System.

The ZONARE z.one_{pro} is used for ultrasound evaluation of the following applications: Fetal, Abdominal, Intraoperative, Pediatric, Ophthalmic, Small Organ/Parts (breast/testes, thyroid, etc), Transvaginal, Transrectal, Transcranial, OB/GYN, Cardiac, Pelvic, Neonatal/Adult Cephalic, Vascular, Tissue Elasticity, Contrast Imaging, Musculoskeletal, Superficial Musculoskeletal and Peripheral Vascular applications. Users include ultrasound imaging technicians (sonographers) and physicians. ZONARE Ultrasound Imaging Systems may be used in a hospital (e.g. imaging laboratory, emergency room, patient bedside, operating room), medical clinic, physician's office or a mobile imaging center. Please refer to the z.one_{pro} Ultrasound Platform Instructions For Use for more information.

The z.one_{pro} consists of two major components: 1) Cart; and, 2) Transducer(s). The Cart contains the software driven imaging electronics and user interfaces (keyboard, monitor, handles, etc.). It houses the microprocessor, memory, amplifiers and power supplies for the microprocessor. It sends electrical currents to and receives electrical pulses from the compatible ZONARE transducers. The Cart performs the calculations involved in processing the data to produce the displayed ultrasound images. Cart options include, but are not limited to, echocardiography (which includes continuous wave (CW), physiologic signals (ECG and respiration) and the cardiac calculation package), advanced vascular (which includes CW) and the streamlined Special Procedures user interface.

Available with the system are one or more ZONARE Curvilinear, Endocavity, Linear, or Phased array transducers allowing for many clinical applications. Accessories include, but are not limited to the ZONARE ZPAK Battery and off-the-shelf components: bar code reader, foot pedal, printers, biopsy guides, ECG cables and a wireless Ethernet interface. Case studies can be stored to USB memory stick, DVD, and other industry standard archiving devices.

Note: The availability of options may be limited based on country or region of use.

Product Overview

The system consists of a limited number of Field Replaceable Units (FRU's). The FRU's for this unit are:

- 17" Display
- User Interface Assembly
- System Module
- Power Module
- Z-PAK Battery Pack
- Misc cables and mechanical assemblies

Definitions/Acronyms

2D: Two dimensional (B-Mode, Color mode)

BMP: **Bit MaP**
C-Mode: **Color Flow Mode (Doppler)**
D-Mode: **Doppler (Pulsed Wave) Mode**
DICOM: **Digital Imaging and COmmunication in Medicine**
DSP: **Digital Signal Processing**
ESD: **Electro Static Discharge**
EV: **Endo Vaginal**
FPGA: **Field Programmable Gate Array**
FRU: **Field Replaceable Unit**
LCD: **Liquid Crystal Display**
LED: **Light Emitting Diode**
M: **M-Mode (Motion Mode - Tissue)**
NTSC: **National Television Standards Committee (video standard)**
PAL: **Phase Alternation by Line (video standard)**
PRF: **Pulse Repetition Frequency**
PW: **Pulsed Wave Mode (Doppler)**
Retrospective: .. **Post-processing performed on frozen images from memory**
DGC: **Depth Gain Compensation**
USB: **Universal Serial Bus**

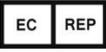
Documentation Conventions

The following alert conventions are used in this manual:

2.1.1 SYMBOLS

The following symbols may be used in this manual or elsewhere in product labeling.

Symbol	Description
	Information that may relate to safety of the patient, the operator, or the equipment
	A type BF patient-applied part (B= body, F= floating applied part)
	A type CF patient-applied part (C= cardiac, F= floating applied part)
	Alternating current (AC)
	Direct current (DC)
	Date of manufacture
	Manufacturer
	Caution: ESD sensitive
	Recyclable material
V	Voltage
Hz	Cycles per second
	Waste Electrical & Electronic Equipment Standard Applies to EU Member States only: this system should not be treated as household waste. ZONARE meets the WEEE Standard. For more information on returning or recycling this system, please contact Mindray or the distributor from whom you purchased the system.

Symbol	Description
	Consult the Instructions for Use
	ZONARE serial number
	Authorized representative in the European Community
	Catalog number
	Shipping & Storage: Fragile
	Shipping & Storage: Keep dry
	Shipping & Storage: Temperature limits
	Shipping & Storage: This side UP
	Shipping & Storage: Do not stack above this container
	Shipping & Storage: Humidity limits
	Shipping & Storage: Pressure limits
Rx Only	Federal law restricts this device to sale by or on the order of a licensed healthcare practitioner (USA).

It is extremely important to read the following definitions of WARNING information, prior to beginning any service on any sub-system within the system. As you see applicability of each of these noted WARNINGS, during the course of the servicing process, be prepared to avoid harm to persons and equipment by proper adherence.

WARNINGS & Cautions

It is not possible for ZONARE to anticipate every condition and situation in which ZONARE ultrasound system will be used. The following warnings and cautions represent typical situations that require special attention. User knowledge and experience with a specific application and environment must also be taken into consideration in order to help ensure the safety of personnel and equipment.

Safety Standards

All ZONARE instruments, cables, and diagnostic ultrasound imaging transducers have been designed to meet the essential requirements contained in 93/42/EEC (Medical Device Directive), and all appropriate requirements contained within UL 60601 (Standard Medical Electrical Equipment, Part 1: General Requirements for Safety), IEC 60601 (Medical electrical equipment - Part 1: General requirements for basic safety and essential performance), IEC 60601-2-37 (Medical electrical equipment - Part 2-37: Particular requirements for the safety of ultrasonic medical diagnostic and monitoring equipment) and JIS-T-1501 (General Methods of Measuring the Performance of Ultrasonic Pulse-Echo Diagnostic Equipment), including limits for current leakage and isolation from a primary power line. Testing for compliance with the essential requirements of the Medical Device Directive has been performed.

The following is a comprehensive list of the Warnings & Precautions associated with the use of ZONARE's z.one_{pro} Ultrasound System and compatible transducers.



Warnings

- Do not remove any of the System covers other than the module cover. Other than the scan module there are no user-serviceable parts internal to the system. Only trained ZONARE service personnel should access the system's internal electronics.
- The ultrasound systems contain no operator-serviceable components within the enclosures. To avoid electrical shock, do not remove covers. As with any other electrical equipment, always observe care when operating this instrument. For service issues, contact Mindray Technical Support. Failure to follow these restrictions may void your warranty or service contract coverage.
- To reduce the risk of electric shock, DO NOT connect the z.one_{pro} system input or output connections to equipment that is not properly connected to an Earth ground
- To achieve proper grounding reliability, the ultrasound system power plug must be fully inserted into a receptacle marked "hospital grade." Do not remove the grounding wire. If there is any question of power outlet or power cord integrity, do not proceed. Obtain qualified assistance

- To maintain proper grounding reliability, use only ZONARE-recommended peripherals and accessories. Use of non-specified peripherals and accessories could result in risk of electrical shock or injury
- The ultrasound systems represent a potential explosion hazard if used in the presence of flammable anesthetics.
- The system does not contain a user-serviceable lithium ion battery.
- The optional ZPAK cart battery is not a user serviceable item. Contact Mindray's Technical Support group for assistance with the ZPAK battery.
- Follow guidelines provided by IEC 60601 when connecting peripherals.
- The USB Memory Sticks supplied by ZONARE are the recommended brand, type, and sizes for use in the z.one_{pro} Systems. They have been verified for optimum reliability and performance.
- No modification of the system is permitted. Modifying the system may subject the operator or patient to hazardous conditions.
- To reduce the risk of electric shock, do not connect the z.one_{pro} input or output connections to equipment that is not properly connected to an Earth ground.
- The z.one_{pro} ultrasound system represents a potential explosion hazard if used in the presence of flammable gases or oxygen rich environment.
- Use only transducers that are specifically approved and licensed for the ultrasound system. If the proper identification of a connected transducer is not displayed on screen, do not proceed with its use.
- Transducers covers may be contaminated and must be handled accordingly.
- Inspect the transducer and Ultrasound System before each use. Inspect the transducer face, housing, cable, connectors, and cases. Do not use the unit if damage is detected.
- Bent, broken, or missing pins on the transducer connector may cause poor image quality, including possible mirror image artifact. Be sure to check pins before connecting transducer to the ZONARE ultrasound system. If pins are bent, broken, or missing, do not use the transducer and call ZONARE Technical Support.
- To avoid electrical shock, always unplug the ultrasound system AC power cord from wall outlet before cleaning any part. Do not immerse the transducer past the specified cleaning/disinfection level, as specified in Transducer Cleaning and Disinfection. Do not immerse the transducer for longer than the specified cleaning/disinfecting time. Do not use any transducer that has been immersed beyond the maximum limit or has been soaked longer than the maximum specified time.
- Do not allow disinfectant to contact metal surfaces. Always use protective eyewear and clothing when cleaning or disinfecting device
- Disinfectant wipes and topical spray products are not FDA cleared high-level disinfectants and do not provide adequate protection should the transducer become cross-contaminated.
- The transducer must be removed from patient contact before application of a high-voltage defibrillation.
- The system is not intended for use in conjunction with high frequency (HF) surgical equipment (tissue ablation devices). Do not use transducers connected to the ultrasound system on patients while HF surgical devices are in use.
- If using IEC 60601 compliant equipment that was not provided by ZONARE, it is required that total leakage currents be tested and validated to be below the IEC 60601 limits.
- This equipment must only be connected to a supply main with protective earth.

- Validate that measured and calculated results shown in Calc Package reports reflect the clinical observations.
- Auto-Dop Trace is intended to serve as an adjunct to the diagnostic process in evaluating blood flow during PW Doppler examinations. When using the Auto-Dop Trace feature, please evaluate the results to verify that you are in agreement before committing the values to the Calc Report Package.
- Always examine transducers for damage, such as cracks, splitting, holes, or fluid leaks. If damage is evident, discontinue use of the transducer and contact Mindray.
- Prior to initiating any disinfection process, disconnect the transducer from the ultrasound system.
- Ensure that any connected external equipment, such as external monitors, printers and peripherals; comply with relevant standards such as IEC60601-1 and IEC60601-1-2.
- If an external video monitor is connected to the z.one_{pro} system, it is necessary to ensure that an RF ferrite is clamped to the cable as close to the z.one_{pro} system as possible. Use a ferrite such as Fair-Rite Products Corp. 0431167281 (or an equivalent).
- The potential equalization terminal, located by the AC Mains connection, is connected to the system chassis. It can be connected to corresponding terminals on other equipment to eliminate potential differences. Do NOT use it for additional protective grounding
- Damage to the system may cause poor image quality, including possible imaging artifacts sometimes referred to as ‘halo’ or ‘headlight’ artifacts. Regularly inspect the system for damage and know how to recognize imaging artifacts.
- There are many types of system use and system error messages that might be displayed during the use of the z.one_{pro} Ultrasound System. If a message is encountered that is not self explanatory, contact Mindray service for assistance.
- Do not touch any of the connector contacts while performing a patient examination to prevent the possibility of a hazardous current path.

Warnings - Ocular Imaging

- To avoid injury to the patient, use only the **Ocular Preset** when imaging through the eye. The FDA has established lower acoustic energy limits for ophthalmic use. The system will not exceed these limits only if the **Ocular Preset** is selected

Warnings – Battery

- To avoid electrical shock, do not touch the battery contact.
- To avoid risk of fire, explosion, or burns:
 - Do not disassemble or alter the battery.
 - Do not short-circuit the battery by directly connecting the positive and negative terminals with metal objects.
 - Do not heat or discard the battery in a fire.
 - Do not expose the battery to temperatures above 65 °C (150 °F).
 - Do not charge the battery near a heat source.
 - Do not leave the battery in direct sunlight.
 - Do not use a damaged battery.
 - Charge the battery at room temperature.
 - The battery should only be charged within the z.one_{pro} System or a ZONARE provided battery charger.

- Inspect the battery for damage before charging or placing the battery in the z.one_{pro} System.
- Do not connect battery to an electrical power outlet.
- Do not continue to recharge the battery if it does not recharge fully after 4 hours.
- To avoid electrical shock, do not touch the battery contact.

Warnings – ECG

- The ECG and the Respirometer functionality are not intended for ECG diagnosis. It must not be used for intraoperative applications of the heart. Use only the recommended patient cable supplied by ZONARE. Make sure that bare parts of the electrodes and the patient do not come in contact with conductive parts, such as metal examination beds, trolleys, and similar items.
- Before defibrillation, always disconnect the ECG cable connector from the system and make sure the connector does not come in contact with other persons or conductive surfaces, such as metal examination beds, trolleys, and similar items.
- Operating your system with ECG signals below 0.25 mV may cause inaccurate results.

Warnings – TEE Transducer

- The multiplane TEE transducer should be used only by a qualified physician who has received appropriate training in proper operation of the probe and in endoscopic techniques as dictated by current relevant medical practices.
- Electrical Hazard: Any evidence of damage indicates the probe cannot be used and should be returned to ZONARE for evaluation and repair.
- Biological Hazard: Adequate cleaning and, if necessary, disinfection are carried out to prevent disease transmission. It is the responsibility of the user to verify and maintain the effectiveness of the procedure used. A single-use, sterile disposable sheath for TEE purposes can be used.
- Inspect the transducer connector pins for contamination or damaged pins that might interrupt signal flow through the connection. Be sure to check pins before connecting transducer to the ZONARE ultrasound system. If pins are bent, broken, or missing, do not use the transducer and call ZONARE Technical Support.
- Immediately replace a transducer that exhibits any damage symptoms.
- Before introducing the probe, do not rub or spray the tip of the probe with an anesthetic agent.
- Avoid forceful manipulations and excessive force in using the probe that could result in patient injury.
- Withdraw the probe only with the deflection control in the unlock mode and with the distal end of the probe straight.
- The use of a biteguard is mandatory. Failure to use the biteguard may result in damage to the probe, which could result in a safety hazard. Damage to the probe due to biting is not covered by the probe's warranty.
- Check if the maximum deflection of the tip is 90 ° to 120 ° upward, 60 ° to 90 ° downwards and 30 ° to 45 ° left/right. If the deflection shows an unwanted amount of free play or exceeds the maximal deflection angles given above, do not use the probe. Contact the service organization to re-adjust the steering of the probe. In this way, the risk of "buckling" or "U-turning" of the probe in the esophagus is minimized.
- Avoid damage to the probe by allowing nothing to protrude beyond the case when closing the lid.

- Prior to cleaning any device, turn off the system and disconnect power cord from AC power source to avoid electrical shock.
- Always use protective eyewear and clothing when cleaning or disinfecting the transducers.
- Do not allow the disinfectant to come in contact with metal surfaces (transducer connector). Use a soft cloth and warm soapy water to remove any disinfectant that remains on metal surfaces.
- Keep the control handle and transducer connector out of any cleaning or disinfection solutions. The control handle and cable may be cleaned with a damp cloth, but only the distal end of the probe up to the 100cm marker on the shaft may be placed into a disinfection solution.
- Do not use other disinfection methods like Iodine, Steam, Heat or Ethylene Oxide.
- When servicing the z.one_{pro} System, always be sure to turn the circuit breaker to the OFF position.



Precautions

- Transducers are individually licensed according to system configuration. Only the following transducers are available without an advanced feature configuration: C4-1, C6-2, C9-3, C9-3sp, E9-4, L8-3, L10-5, L14-5w, P4-1c and P8-3TEE. The A2CW and A5CW transducers are enabled if the system is configured with either the Echocardiography or the Advanced Vascular Imaging Feature Sets. Attempting to use any other transducers will result in an error message.
- Be aware of the potential hazards associated with the environment where the ultrasound systems will be used. The systems and/or the external equipment can be damaged if signal levels are not appropriate. If peripheral equipment not specifically authorized by ZONARE is to be connected to the system, it must meet all applicable electrical safety standards that apply to the system in order to maintain ZONARE's safety integrity. Any equipment not supplied by ZONARE must be approved by ZONARE. Use of non- Mindray -approved equipment may result in an unsafe condition, impair operation of the ultrasound system, impair diagnostic capabilities, and void your warranty or service contract coverage.
- ZONARE transducers have a specific range of acceptable application use. Users are advised to restrict each transducer's use to those applications. Excessive bending, twisting, pulling, dragging, or compression of transducer cables may cause failure or intermittent operation of the system. Avoid rolling the cart wheels over cables. Use of cable hooks is recommended to minimize chance of damage to cables.
- If a transducer that has not been approved and licensed for use with the ultrasound system to which it is connected, or if a licensed transducer is not properly connected, the corresponding transducer identification data will not display on the LCD Display. Imaging will be disabled. Resolve this issue before continuing use.
- The ultrasound system and/or the transducer could be damaged if a nonapproved transducer is connected.
- Improper cleaning or disinfection of patient applied parts may cause permanent damage. Carefully review the manufacturer's directions for any component used with ZONARE ultrasound systems. zonare assumes no liability with respect to single-use devices that are reused, reprocessed, or resterilized and makes no warranties, expressed or implied (including the warranties of merchantability or fitness for a particular use), with respect to such devices.

- Use of peripherals or other equipment not provided by ZONARE may result in system damage or degraded performance. Carefully review the labeling of any such equipment before connecting to the ZONARE system.
- Improper setting of imaging controls may obscure diagnostically valuable information in the display. The factory default preset maps were preselected as appropriate for most imaging circumstances. Improper user configuration of custom presets may obscure diagnostically valuable information.
- ZONARE ultrasound systems are manufactured in compliance with existing electromagnetic immunity (EMI) and electromagnetic compatibility (EMC) requirements. Use of the systems in the presence of an electromagnetic field can cause degradation of the ultrasound image.
- Electrostatic discharge (ESD), or static shock, is a naturally occurring phenomenon. ESD is common in low humidity, which can be caused by heating or air conditioning. ESD shock occurs when electrical energy is discharged from one body, to a differently charged body. To lessen the occurrence of ESD, use antistatic spray on carpets and flooring, and antistatic mats.
- To minimize potential ESD damage and electrical contact contamination, avoid touching the metal contacts for the transducer connections, at both the z.one_{pro} port and the transducer connector.
- If the z.one_{pro} System has been moved between environments with extremes of temperature and/or humidity, allow the z.one_{pro} System to rest for at least 30 minutes in a controlled environment before using.
- Do not use the ultrasound system if any error message displays on the screen.
- Do not block airflow to any ventilation holes on the system.
- Do not submerge the transducer past the points indicated in ‘ZONARE Transducers Cleaning and Disinfection.
- Do not spill liquid on the systems or transducers.
- Using a non-recommended cleaning or disinfectant solution, incorrect solution strength, or immersing the transducer deeper or longer than indicated can damage the transducer. Damages linked to the use of disapproved chemicals are not covered under product warranty or service contract.
- The use of non-shielded cables may result in increased emissions and decreased immunity to external signals
- Operating the systems in the presence of external electromagnetic fields can degrade the quality of the ultrasound image. High-frequency devices, such as electro-surgical devices, can produce image artifacts. If required, a review of the local electromagnetic environment may be required to minimize the sources of external noise generators.
- The use of non-Mindray approved cables and accessories may result in increased radiated emissions as well as decreased immunity to external signal fields.
- Before beginning to image a new patient, be sure to conclude any in-progress patient exam by pressing the New Patient key. Failure to do so will result in any subsequent storing of images being mistakenly written to the previous patient exam directory.
- Some components or devices such as transducer covers used with ZONARE systems are for single-patient use only. Reuse, reprocessing, or re-sterilization of these devices may compromise their structural integrity.
- Any image sets stored on the system, that are not identified by patient name and number, will be stored with a unique number based off of the system ID.
- Exercise care in adjusting all settings to avoid obscuring low-level signals that may have diagnostic value. Improper settings can seriously degrade image quality.
- Do not touch exposed metal of transducer connector.

- Validate all entries in the Measurement Summary.
- Ultrasound imaging capabilities can vary from patient to patient. Ultrasound should be used as one component in a comprehensive diagnostic plan.
- Never leave a probe in the disinfection solution for more than 45 minutes. Please refer to the instructions for use that came with the disinfectant for minimal required exposure times. Do not forget to rinse the probe directly after disinfection.
- Only use water-soluble acoustic coupling gel. Other coupling gels can cause probe damage.
- Long-term exposure to ultrasound should be minimized. Although there have been no confirmed adverse effects produced by diagnostic levels of ultrasound, unnecessary patient exposure to ultrasound energy should be avoided, especially in the Doppler mode.
- Use of a non-compatible USB Memory Stick may result in file corruption or long file transfer times. Please confirm proper operation of any memory stick prior to attempting to use for clinical data.
- Make sure the z.one_{pro} System has fully completed downloading upgrades, importing/exporting, or collecting log data to the USB Memory Stick before removing it from the z.one_{pro} System. Failure to do so will result in loss of data.
- Wide variability in CD and DVD quality may prevent the system from reliably writing to and reading from some commercially available discs. ZONARE has tested the CD and DVD in the table below and currently recommends their use. For up-to-date CD/DVD recommendations, go to: <http://www.zonare.com/support/accessories/media>.
- Before deleting any Exam data from the z.one_{pro} System, always verify that data was successfully transferred to the CD/DVD by viewing it on an external reader/player..Review the user maintenance section of the instructions for use for proper technique and approved agents for cleaning the external surfaces of the system.
- Review the z.one_{pro} DICOM conformance statement before integrating with any PACS system.
- Validate Structured Report export prior to clinical use.
- Use-time from the optional z.one_{pro} battery pack will vary depending on the system usage and battery conditioning. Ensure the battery is adequately charged before starting a procedure without AC main power.
- Export patient studies in a timely manner. Do not use the system storage as the sole location of patient studies for an extended period of time.
- IQ scan data should not be relied on for primary storage of diagnostic data. Use of IQ scan data across software versions is not guaranteed.
- Diagnostic data exported to CD/DVD should be verified on an external system before deleting that data from the z.one_{pro} system.
- The system is not indicated for differentiation between malignant and benign breast lesions.



USB Memory Stick CAUTIONS

USB Memory Sticks that are purchased from outside sources (besides ZONARE) may not be compatible for use with a system. USB Memory Sticks which are labeled as “**U3 Smart Technology**” on their label or packaging will NOT be recognized (or function) by a system.

In the case of having one of these incompatible format USB Memory Sticks. There are freeware U3 Smart Technology “Removal” programs available on the internet, that can be downloaded and run to make the USB Memory Sticks useable in the system.

Precautions – TEE Transducer

- TEE: Perform an electrical leakage test prior to each use of the transducer. See the TEE Maintenance Guide or the TEE Leakage Test Quick Reference Guide for details.
- TEE: Examine the transducer prior to each use. See the TEE Maintenance Guide or the TEE Quick Reference Guide (K90056) for details.
- TEE: Clean and disinfect after each use.
- TEE: Always use a bite guard.
- TEE: Always use single-use probe sheath.
- TEE: Ensure articulation locks are disengaged and straighten mechanism during device insertion or extraction from patient.
- TEE: Remove the transducer from the patient prior to defibrillation.
- TEE: Handle with care, very delicate instrument.
- TEE: Do not store the disinfected transducer in the carrying case. Only use the case for transportation.
- TEE transducer is a delicate medical instrument, handle with care.
- The multiplane TEE probe is a precision instrument, which must be handled with care. It may be damaged when dropped or abused. In particular, do not allow the ultrasonic window in the tip to come into contact with a sharp object. Do not touch this window unnecessarily. Never exert force onto the acoustic window.
- The transducer connector is not watertight, and should always be kept dry. The control handle, although spray-watertight, should not be immersed.
- This equipment contains no operator serviceable components. To prevent electric shock, do not remove any covers or panels.
- Never manually deflect the distal tip of the probe; use only the deflection control wheels.
- Do not kink, tightly coil, or apply excessive force on the probe cable or shaft. Insulation failure may result.
- Under normal conditions at full acoustic power the temperature of the tip does not exceed 43 °C. Be sure to check at least monthly that the temperature increase of the tip is within limits:
- Connect the probe to the Ultrasound system.
- Adjust the acoustic power to the highest value possible.
- Select Color Doppler mode.
- Wait for 2 minutes.
- Feel at the distal end of the probe if there is a temperature increase that could be harmful for the patient.
- When a brush is used for cleaning the transducer, use only a soft brush; coarse/stiff-bristle brushes may cause transducer damage
- Keep the control handle and transducer connector out of any cleaning or disinfection solutions. The control handle and cable may be cleaned with a damp cloth, but only the distal end of the probe up to the 100cm marker on the shaft may be placed into a disinfection solution.
- During immersion disinfection, never immerse the transducers longer than 45 minutes. Damage may occur to the transducer housing and/or components if disinfection times exceed these recommended limits.

Precautions – Panoramic Imaging

- Measurements on a panoramic image are limited in accuracy by the acquisition of the image by the user
- Measurements out of plane are potentially less accurate.
- A good B Mode/2D image is important for a high-quality panoramic image.

Precautions – 3D/4D Imaging

- 3D: Measurements out of plane are potentially less accurate due to movement of tissue.
- A good B Mode/2D image is important for a high-quality 3D/4D image.

Precautions - WIRELESS

- WIRELESS: The ZONARE Wireless option device is an RF Receiver and Transmitter, operating using industry standard 802.11 b/g protocols. Use of the wireless option, in the presence of other high energy RF radiating devices may interfere with the transmission of data to the network interfaces.
- WIRELESS: The ZONARE Wireless option device supports several industry standard security protocols and should be enabled to reduce the chance of patient data, transmitter over the wireless interface from the possible undesired interception of the data.
- WIRELESS: Data transmission and reception rates are limited to by the bandwidth of the user's network infrastructure. A Quality of Service (QOS) level is determined by the number of users on the network, the data being transferred by the users, distance of the ZONARE system to the wireless access point and other factors.

Electrical Safety

- ZONARE systems meet IEC 60601, Class I powered equipment requirements.
- The z.one_{pro} ultrasound system complies with the applicable medical equipment requirements published in the European Norm (EN) and International Electronics Consortium (IEC) Harmonized Standards.
- The transducers, when used with the z.one_{pro} system, are certified to be in compliance with IEC 60601 as Type BF or Type CF applied patient parts. Each transducer or port is labeled accordingly.

Contrast Imaging

Cardiac rhythm disturbances during perfusion studies using gas ultrasound contrast agents have been observed in the diagnostic range of MI values. See the *Instructions For Use* that came with contrast agent being used for details.

Medical Ultrasound Safety - General

Anyone using ZONARE ultrasound systems for human exams of any kind should thoroughly understand the implications of such use. The American Institute of Ultrasound in Medicine (AIUM) has published a document titled Medical Ultrasound Safety (AIUM 1994). ALARA is an abbreviation for the principle of prudent use of diagnostic ultrasound by obtaining the diagnostic information at a power output that is as low as reasonably achievable.

Diagnostic ultrasound is a technique-dependent imaging modality. To obtain the best possible patient care from any ultrasound equipment, the system must be operated by personnel trained in ultrasound image acquisition and interpretation. Users must become familiar with each of their imaging systems.

- Always make sure appropriate transducer is used for study being performed
- Always make sure active preset is appropriate for study being performed
- Know how to recognize acoustic artifacts in image
- Consult AIUM recommended protocols & equipment specifications

4 SYSTEM SPECIFICATIONS

This section contains system and accessory specifications. For information on the specifications for ZONARE authorized peripherals, refer to the manufacturers' documentation.

General system specifications

Type	Parameter	Value
Electrical	Power requirements	100-240V~, 50-60Hz, 6A max
	Power consumption (no peripherals – max)	180W (616 BTU/hr)
	Power consumption (with peripherals – max)	470W (1608 BTU/hr)
Environmental (operating)	Cooling requirements	See power consumption above
	Air temperature	0-35C (32 – 95F)
	Humidity	15-80% noncondensing
	Pressure	700-1060 hPa
Environmental (storage)	Air temperature	-20-60°C (-4-140°F)
	Humidity	15-90%, noncondensing
	Pressure	500-1060 hPa
Physical (weight)	z.one _{pro} system	65.3 kg (144 lbs.)
	Power cord	0.6 kg (1.4 lbs.)
	USB printer & bracket	3.4 kg (7.6 lbs.)
	Battery & bracket	4.1 kg (9.1 lbs.)
	Operating weight subtotal	73.4 kg (162.1 lbs.)
	System shipping container	41.5 kg (91.6 lbs.)
	Total shipping weight	114.9 kg (253.7 lbs.)
Physical (dimensions)	Height, max (in operating use)	157.5 cm (62 in.)

	Height, min (in operating use)	128 cm (50.5 in.)
	Height, min (display lowered for transport)	104 cm (41 in.)
	Width	51 cm (20.1 in.)
	Depth	72 cm (28.2 in.)

Type	Parameter	Value
IO connectors	Ethernet (1 port)	RJ-45 – 10/100BaseT
	USB 2.0 (3 ports)	USB-Type A (Vbus 5.0V, 0.5A max)
	Serial Port	eSATAp
	External Video (1 port)	HDMI 1280X1024
Wireless Option	Manufacturer	B&B Electronics / Quatech
	Manufacturer PN:	ABDG-ET-DP501
	Wireless Technology	IEEE 802.11b/g, WiFi compliant
	Wired Interface	10/100 Ethernet (auto sense), RJ-45 Plug
	Frequency	DSSS, CCK, OFDM
	Modulation Technology	DSSS, CCK, OFDM
	Modulation Type	DBPSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM
	Network Access Modes	Infrastructure, Ad Hoc
	Channels	USA/Canada: 11 channels Europe: 13 channels France: 4 channels Japan: 14 channels (13 channels for 802.11g)
	Wireless Data Rate	802.11b = 11, 5.5, 2, 1 Mbps 802.11g = 54, 48, 36, 24, 18, 12, 9, 6 Mbps
	MAC	CSMA/CA with ACK, RTS, CTS
	Network Protocols	TCP/IP, ARP, ICMP, DHCP, DNS, HTTP, UDAP Discovery, TFTP, UDP, PING
	Receive Sensitivity	54Mb/s = -69dBm 6 Mb/s = -86dBm 1Mb/s = -86dBm
Wireless Security	Disabled, WEP 64 & 128bit, WPA (TKIP), WPA (AES), WPA2	

Type	Parameter	Value
		(AES), 802.1x (EAP), Supports WPA & WPA2 Enterprise, EAP- TLS/MSCHAPV2, EAP-TTLS/MSCHAPv2, EAP-TTLS(MD5), EAP-PEAPv0/MSCHAPv2, LEAP - Zero host security footprint - Supports Certificate, delivery and management
	Network Addressing Translation (NAT)	ABDG-BR-DP501, Client Bridge ABDG-ET-DP501, NAT 3 Router
	Antenna	ABDG-BR-DP501, Client Bridge ABDG-ET-DP501, NAT 3 Router
	Regulatory Compliance	Worldwide Certificate Support- FCC Part 15 Class B Sub C Modular Approval, IOC, CE, ETSI EN300 328, ETSI 60950-1, ROHS and WEEE Compliant

Display

Parameter	Value
Display size	17"
Resolution	1280 x 1024
Pixel pitch	0.264 mm
Contrast Ratio	500(min)
Connectors	Mini-HDMI (video), mini-DIN (power)
Rotation	+/- 85 degrees
Brightness and contrast adjustments	Via on-screen system menus

Battery Pack Specifications

Type	Parameter	Value
Electrical	Power rating	15.6V, 16Ah = 250 Wh
	Chemistry	NiMh
Physical		4kg (10 lb.)

(weight)		
Operational	Operating time duration (fully charged)	Up to 1.5 hours
Physical (dimensions)	Height	75 mm (3 in.)
	Width	260 mm (10 in.)
	Depth	355 mm (14 in.)

Transducers



C9-3(I.D. 130)

- Penetration Depth 18 cm
- Number of Elements 128
- Field of View 67 degrees
- Radius of Curvature 33 mm
- Ultrasound Bandwidth 9-3 MHz



C9-3sp(I.D. 131)

- Penetration Depth 18 cm
- Number of Elements 128
- Field of View 67 degrees
- Radius of Curvature 33 mm
- Ultrasound Bandwidth 9-3 MHz



C6-2(I.D. 129)

- Penetration Depth 24 cm
- Number of Elements 128
- Field of View 65 degrees
- Radius of Curvature 50 mm
- Ultrasound Bandwidth 6-2 MHz



C4-1(I.D. 2)

- Penetration Depth 30 cm
- Number of Elements 64
- Field of View 80 degrees
- Ultrasound Bandwidth 4-1 MHz



L14-5W(I.D. 71)

- Penetration Depth 10 cm
- Number of Elements 192
- Field of View 55 mm
- Ultrasound Bandwidth 14-5 MHz



L10-5.....(I.D. 64)

- Penetration Depth 10 cm
- Number of Elements 128
- Field of View 38 mm
- Ultrasound Bandwidth 10-5 MHz



L8-3(I.D. 65)

- Penetration Depth 10 cm
- Number of Elements 128
- Field of View 38 mm
- Ultrasound Bandwidth 8-3 MHz



E9-4(I.D. 144)

- Penetration Depth 14 cm
- Number of Elements 128
- Field of View 135 degrees
- Radius of Curvature 12 mm
- Ultrasound Bandwidth 9-4 MHz



P4-1c.....(I.D. 6)

- Penetration Depth 30 cm
- Number of Elements 64
- Field of View 84 degrees
- Ultrasound Bandwidth 4-1 MHz



A2CW.....(I.D. 514)

- Number of Elements 2
- Ultrasound Frequency 2.0MHz
- Ultrasound Bandwidth n/a



A5CW.....(I.D. 513)

- Number of Elements 2
- Ultrasound Frequency 5.0MHz
- Ultrasound Bandwidth n/a



P8-TEE.....(I.D. 8)

- Penetration Depth 8 cm
- Number of Elements 64
- Ultrasound Bandwidth 8-3 MHz

Standards and Compliance

The z.one_{pro} system has been designed, manufactured, tested, and certified to comply with the following internationally recognized standards.

IEC 60601-1:1988 +A1: 1991 + A2:1995: Medical electrical equipment part 1: General requirements for safety.

IEC 60601-2-37:2001+A1: 2004 + A2:2005: Medical electrical equipment part -37: Particular requirements for the safety of ultrasonic medical diagnostic and monitoring equipment.

IEC 60601-1:2005: Medical electrical equipment part 1: General requirements for basic safety and essential performance. Including US deviations UL 60601-1:2003 R6.03 and Canada deviations CAN/CSA-22.2 No. 601.1-M90

IEC 60601-1-2: 2007: Medical electrical equipment part 1-2: General requirements for basic safety and essential performance. Collateral standard: Electromagnetic compatibility - Requirements and tests.

IEC 60601-2-37:2007: Medical electrical equipment part 2-37: Particular requirements for the basic safety and essential performance of ultrasonic medical diagnostic and monitoring equipment.

IEC 60601-1-2: 2007 Certification

Specification	Compliance
CISPR 11 – RF emissions	Group 1, Class A The z.one _{pro} system is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
IEC 61000-3-2 harmonic emissions	Class A
IEC 61000-3-3 voltage fluctuations/flicker emissions	Complies
IEC 61000-4-2 electrostatic discharge (ESD)	<i>Compliance level:</i> ±6 kV contact ±8 kV air <i>Electromagnetic environment guidance:</i> Floors should be wood, concrete, or ceramic tile. If floors are covered with a synthetic material, the relative humidity should be at least 30%.
IEC 61000-4-3 Radiated Field Immunity	<i>Compliance level:</i> 80MHz - 2.5GHz 3V/m, 80% @2Hz
IEC 61000-4-4 electrical fast transients (EFT)	<i>Compliance level:</i> ±2 kV for AC Mains ±1 kV for I/O lines <i>Electromagnetic environment guidance:</i> Main power quality should be that of a typical commercial or hospital environment.
IEC 61000-4-5 surge	<i>Compliance level:</i> ±1 kV differential mode ±2 kV common mode <i>Electromagnetic environment guidance:</i> Main power quality should be that of a typical commercial or hospital environment.
IEC 61000-4-6 Conducted Immunity	<i>Compliance level:</i> 0.15MHz - 80 MHz 3Vrms @ 2Hz
IEC 61000-4-8 power frequency (50/60 Hz) magnetic field immunity	<i>Compliance level:</i> 3A/m, 50/60Hz <i>Electromagnetic environment guidance:</i> Power frequency magnetic fields should be at levels characteristic of a typical commercial or hospital environment.
IEC 61000-4-11 voltage dips, short interruptions, and voltage variations on power supply input lines	<i>Electromagnetic environment guidance:</i> Main power quality should be that of a typical commercial or hospital environment.

5 SYSTEM OVERVIEW

Major System Assemblies

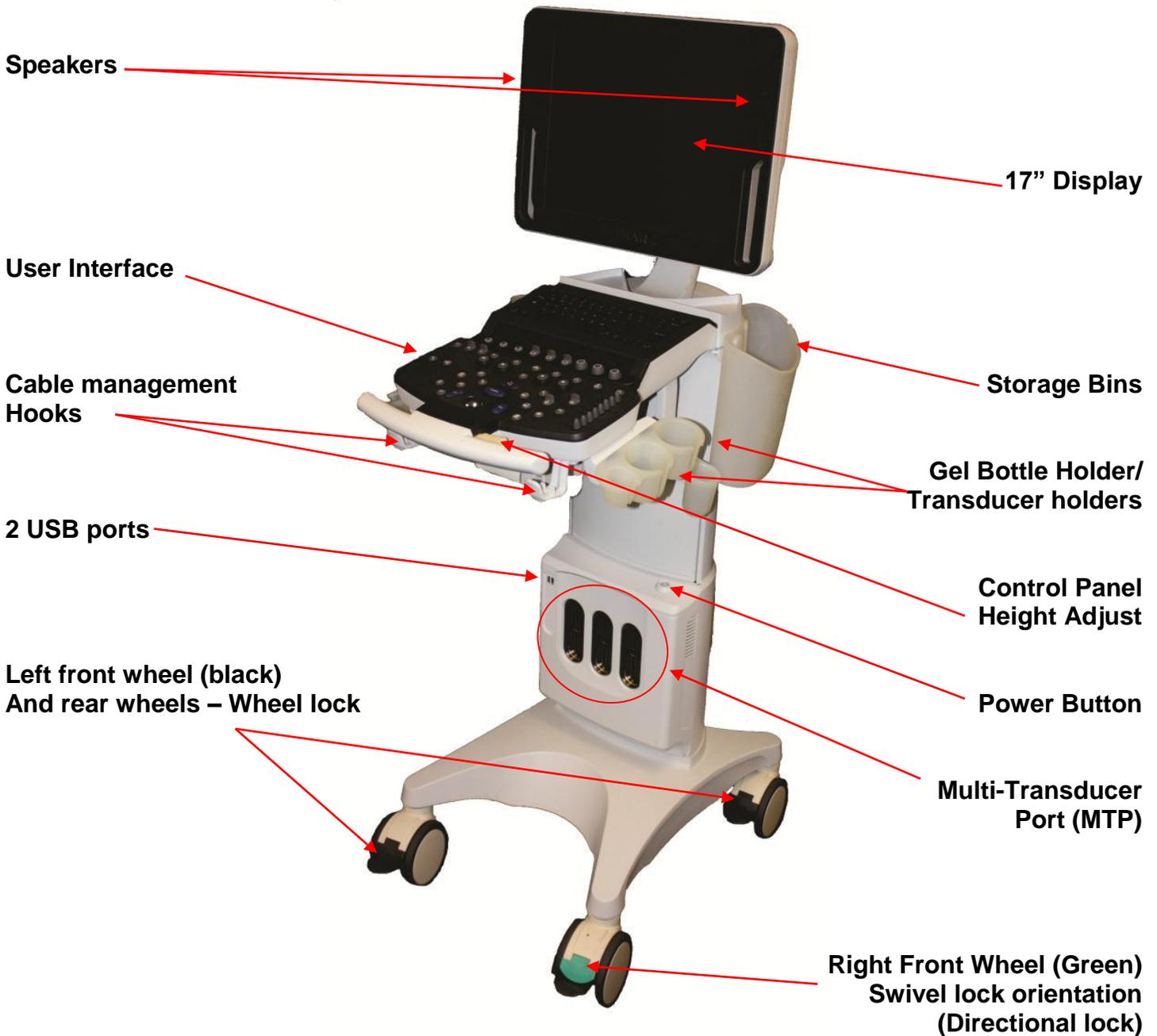




Figure 1.1 - z.one_{pro} Full Featured User Interface is shown above.



Figure 1.2 - z.one_{pro} Special Procedures (SP) User Interface is shown above.

5.1.1 USER INTERFACE FUNCTIONS

Note: Not all controls are available on the SP user interface. Features and functions not directly accessible via hard key are still available however, via menus.

System Control	Description
 Setup	Used to bring up the SYSTEM SETUP configuration menu
 F1 –F4	Function keys, user configurable in System Setup menu
 M-mode	Press to enter M-mode; Rotate to adjust gain
 D-mode	Press to enter Doppler mode; Rotate to adjust gain
 ZOOM	Initiates the variable image magnification process
 C-mode	Press to enter Color Doppler mode; Rotate to adjust gain
 B-mode	Press to enter B-mode (2-D) ; Rotate to adjust gain
 Exam Type	Brings up Exam Type/Presets configuration menu, and six user Preset setting to OLED display windows
 Transducer (MTP)	Used to bring the available transducers to the OLED display windows, for selection of a desired transducer from the 3-Port MTP panel.
 DEPTH	Adjusts (Up/Down) the imaging depth of the display



FREQUENCY

Enables increasing/decreasing transmit frequency



Menu

Press to display menu list.



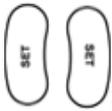
STORE2

Press to store the displayed image to the alternate storage device.



STORE1

Press to store the displayed image to the primary storage device.



SET

“SET” Used to toggle the function of active items on display



FREEZE

Halts or re-starts active imaging on the display



OPTIMIZE

Dual function: “ZST” Sound Speed Correction and/or “AutoOpt” (DGC)



MEASURE

Multi function key:

- 1) Brings up dynamic caliper (live) or Calc menu (frozen)
 - 2) Toggles on/off the **Auto-Dop Trace** function, in PW Doppler mode
-



CALC

Brings up the Calculations menu page.



ENTER (Calc) /

Shared function key:

- 1) Ends the current Calculation process, and produces a result
 - 2) Toggles between the (A) or (B) image, as the “Active” (selected) image, in DUAL mode
-



Undo (Calc)

Deletes active Calculation tool from the display



REPORT (Calc)

Brings up the Calculation report page



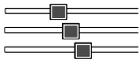
Trackball

Used for positioning the cursor, defining size/position of ROI in color mode, positioning measurement tools, reviewing cine-loop images and navigating form/tables/worksheets/reports



HARMONICS

Activates tissue harmonics imaging mode



DGC

DGC Slide pots Changes gain of image at discrete depths



PRINT

Sends current image to device(s) previously specified in System Setup menu (Local Printer, DICOM printer, DICOM store).



DUAL Mode

Activates/deactivates DUAL imaging mode



Image Width

Enables changing the width (angle) of the active scanning area of the B-Mode sector, to maximize frame rate



Annotation

Press to display the Annotation softkeys for the selected exam/preset and transducer.



Protocol

Used to enable controls for selecting timing (time or cardiac cycle) for Cine Clip stores.



Programmable (3)

Three programmable mode keys

Keyboard Functions

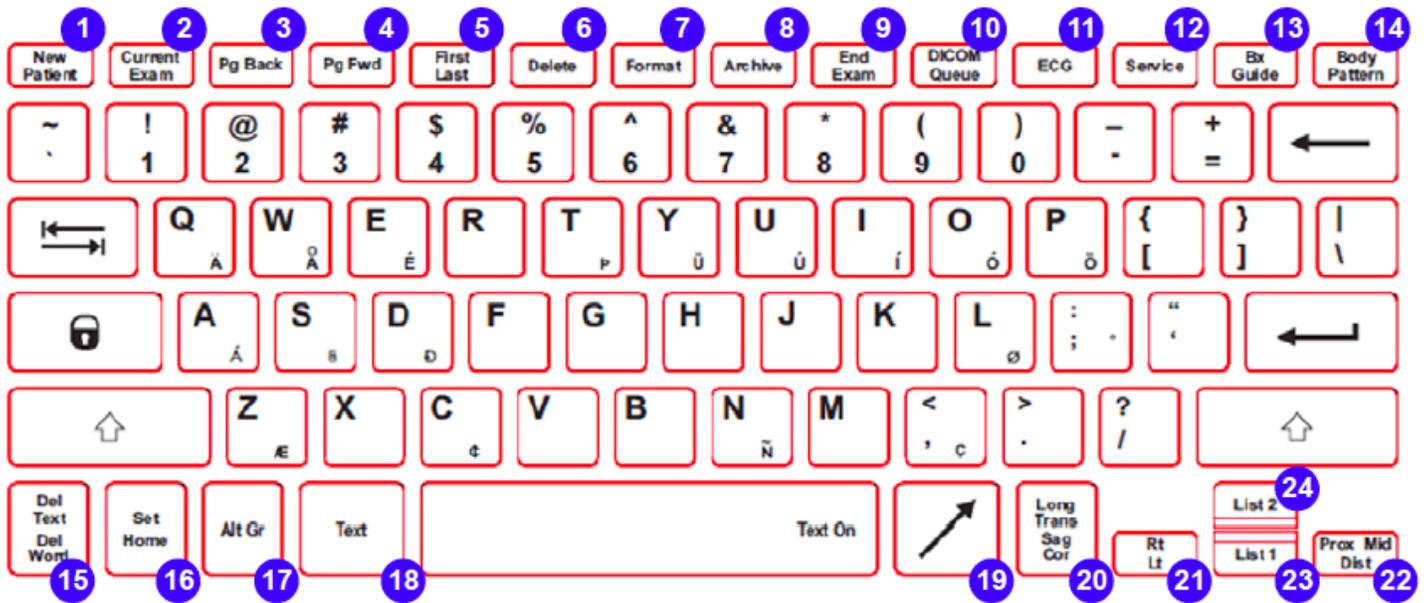


Figure 2: z.one_{pro} keyboard keys and function

KEYBOARD: SPECIAL FUNCTION CONTROLS

Key	System Control	Description
1	NEW PATIENT	This is a toggle key. The first press will display the Patient Information page. The second press will return to the imaging display.
2	CURRENT EXAM	If there is an exam in progress, pressing this key will display the in-progress exam's images, most recently stored image displayed first. If there is no exam in progress, pressing this key will have no effect.
3	PG BACK	This key only works when in in-progress exam review or archived exam review. Pressing this key will display the previous image, or page of images if in a multi-image display format. Once the first page is reached, the key press will have no effect.
4	PG FWD	This key only works when in in-progress exam review or archived exam review. Pressing this key will display the next image, or page of images if in a multi-image display format. Once the last page is reached, the key press will have no effect.
5	FIRST LAST	This key only works when in in-progress exam review or archived exam review. Pressing this key will toggle between the first stored image (or first page of images in a multi-image display format) and the last stored image (or last page of images in a multi-image display format).
6	DELETE	This key only works when in in-progress exam review or archived exam review. When an image has been selected, pressing the Delete key will tag the image for deletion by drawing a red X through it. If the selected image already has been tagged for deletion (red X) pressing the Delete key will remove the red X, untagging the image.

Key	System Control	Description
7	FORMAT	This key only works when in in-progress exam review or archived exam review. Pressing this key will toggle between the following image formats: 2 x 2, displaying 2 rows of 2 images (4 images); 3 x 2, displaying 2 rows of 3 images (6 images); and a full-size image.
8	ARCHIVE	This is a toggle key. The first press will display the Patient Selection Table. The second press will return to imaging.
9	END EXAM	When an exam is in progress, pressing the End Exam key will close the exam. If no exam is in progress, pressing this key will have no effect.
10	DICOM QUEUE	This is a toggle key. The first press will display the DICOM queue. The second press will return to imaging.
11	ECG	CARDIAC Option Systems ONLY: This is a toggle key. The pressing of this key will activate ECG operation and display the ECG trace on the monitor. A repeat press will turn off this function.
12	SERVICE	This is a dual-function key. A " quick " momentary press is a shortcut to bring up the USER DIAGNOSTIC PANEL screen. An " extended " press will trigger a capture of a set of current LOG files to the internal archive
13	BX GUIDE	This is a toggle key. The first press will display the biopsy needle path guide. The second press will remove the biopsy needle path guide.
14	BODY PATTERN	This is a cycling key. Pressing the Body Pattern key will display a Body Pattern for the Exam Type in use. Pressing the key will cycle through available Body Patterns, including a blank.
15	DEL TEXT DEL WORD	Pressing Del Text will remove all text annotations and arrow graphics displayed. Pressing Shift+Del Word will delete the most recently entered text annotation, whether it be free text, POT, or List entry.
16	SET HOME	Pressing Home will move the text annotation cursor to its default home position. Pressing Shift+Set Home will set the current cursor position as the new Home position.
17	ALT GR	Alternate Graphics. Used in conjunction with the QWERTY keyboard, to enable access to international characters.
18	TEXT	Pressing Text will display the text annotation cursor. Pressing Text again will remove the text annotation cursor.
19	ARROW	This is a toggle key. It works when the image is live or frozen. Pressing the key displays an arrow graphic in the middle of the display. Up to 15 arrow may be displayed simultaneously.
20	LONG TRANS SAG COR	This is a cycling key. Pressing this key will cycle between displaying LONG, TRANS, SAG, and COR, for selection as pre-created text annotation.
21	RT LT	This is a cycling key. Pressing this key will cycle between displaying RIGHT and LEFT, for selection as pre-created text annotation.
22	PROX MID DIST	This is a cycling key. Pressing this key will cycle between displaying PROX, MID, and DIST, for selection as pre-created text annotation.
23	LIST 1	Pressing List1 key will display a list of text items entered in List 1.
24	LIST 2	Pressing List 2 key will display a list of text items entered in List 2.

On-Screen “Dashboard” System Status ICONs

If the system is equipped with the on-board battery option, a battery icon will be displayed in the upper-left hand corner of the LCD display of the z.one_{pro}.

Icon	Function	Status Description
	Battery Status	System running on AC Power, and Battery is fully charged .
	Battery Status	System running on AC Power, and Battery is currently charging .
	Battery Status	Battery is currently undergoing a “ Reconditioning ” process (approx 12 hours)
	Battery Status	Battery status is currently unknown
	Battery Status	System running on Battery source power (more than 25% remaining charge)
	Battery Status	System running on Battery source power (10%-25% remaining charge)
	Battery Status	System running on Battery source power (less than 10% remaining charge)
	Cart Storage	Solid state drive is initializing for image storage
	Cart Storage	Solid state drive is storing images
	Cart Storage	>20% of solid state drive storage capacity remaining
	Cart Storage	>5% - <20% of solid state drive storage capacity remaining
	Cart Storage	<5% of solid state drive storage capacity remaining

Icon	Function	Status Description
	DVD Media	DVD media inserted, but <u>not</u> available for image storage
	DVD Media	DVD media inserted and is available for image storage
	DVD Media	Image storage to DVD media is occurring
	DVD Media	DVD is inserted but is FULL
	Removable Media (USB)	Removable storage media (USB) is being initialized
	Removable Media (USB)	Storage operation is actively in-process to removable storage media (USB)
	Removable Media (USB)	>20% of capacity of removable storage media (USB) still remains
	Removable Media (USB)	5-20% of capacity of removable storage media (USB) still remains
	Removable Media (USB)	<5% of capacity of removable storage media (USB) still remains
	USB Local Printer	Local USB printer is connected/active
	USB Local Printer	Local USB printer has a printing job in progress
	USB Local Printer	Local USB printer has an error condition (job will not print)
	USB Generic Device	Generic USB device attached to system (e.g. barcode reader, etc.)

Icon	Function	Status Description
	Network	Network connected and active
	Network	Network <i>disconnected</i>
	Network	Network transfer has an <i>error</i> (Re-Queuing of job, etc) preventing transfer
	Wireless Network	Wireless network connected and active
	Wireless Network	Wireless Network <i>disconnected</i>
	Wireless Network	Wireless Network transfer has an <i>error</i> (Re-Queuing of job, etc) preventing transfer
	Wireless Network	Wireless signal strength: 1% – 20%
	Wireless Network	Wireless Network Wireless signal strength: 21% – 40%
	Wireless Network	Wireless Network Wireless signal strength: 41% – 60%
	Wireless Network	Wireless Network Wireless signal strength: 61% – 80%
	Wireless Network	Wireless Network Wireless signal strength: 81% – 100%

Footswitch Option

An optional remote two-pedal footswitch is available for the z.one_{pro} system.



- The footswitch connects to the system using any one of the free USB ports on the cart.
- The left and right pedals may be individually configured to one of forty-four possibilities including **Freeze** and **Store**.

USB Memory Sticks

The z.one_{pro} system uses removable media (e.g., USB memory sticks) for two purposes:

- Software installer and user preset; system backup
- Patient image archive



NOTE: You can insert a USB memory stick while the z.one_{pro} system is powered on or off.

► To Insert USB Memory Stick

1. Plug the USB memory stick into any available USB port.
2. Make sure the stick is correctly oriented for the port.

When a USB memory stick is plugged in to a USB port, a status icon is displayed on the top left of the imaging screen.

► To Remove USB Memory Stick

1. Make sure the z.one_{pro} system has fully completed downloading upgrades, importing/exporting, or collecting log data to the USB memory stick *before* removing it. Failure to do so results in loss of data.
2. Firmly grasp the USB memory stick and pull it out all the way.



WARNING: The USB memory sticks supplied by ZONARE are the recommended brand, type, and size for use in z.one_{pro} systems. They have been verified for optimum reliability and performance. If you purchase your own USB memory stick, ZONARE is not responsible for any errors associated with file corruption or file-transfer time increases. For a list of USB memory sticks approved by ZONARE, go to www.zonare.com/support/accessories.

WARNING: USB memory sticks designated on the labeling as *U3 Smart*



Figure 3: Rear I/O Panel

5.1.2 FUNCTIONS: I/O CONNECTORS

#	Function	Direction
1	Ethernet 10/100BaseT - (Network)	Input/Output
2	Serial Port - eSATAp	Input/Output
3	USB Port	Input/Output
4	HDMI Connector (video and audio)	Input/Output

Product Shipment

Shipping containers should be inspected for damages, and the “Tip-n-Tell” indicator for signs of mishandling during shipment. If any problems are found, make notes of any discrepancies and immediately report to the shipping carrier and to ZONARE’s shipping department representative.

All installation and set-up of equipment should be done following this official ZONARE product installation procedure.

Electrical Requirements

Medical Grade Receptacles grounded (3-Prong) 110-120 VAC, 15 amp, 60Hz. wall outlets (or proper 220-240 VAC outlets for systems configured for these power requirements) are required for the z.one_{pro} ultrasound system.

Environmental and Space Requirements

The z.one_{pro} ultrasound system may be located anywhere within the facility, as long as there is appropriate power outlets and appropriate network connectivity (at facilities utilizing a DICOM device hook-up).

Uncrating

1. Prior to opening any packaging, inspect the “Tip-n-Tell” indicator (attached to the outside of the main shipping box) for signs that the system has been subjected to shock or tilt conditions during shipment.
2. Also inspect the shipping container for any visual signs of rough handling or abuse during shipment.
3. If any discrepancies from shipment are noted, follow the instructions listed in the “Product Shipment” section above.
4. Remove all banding straps surrounding the cardboard main shipping container.
5. Lift off the top cover portion of the main cardboard shipping container, and set aside.
6. Remove the small boxes (containing the transducers) from the inner storage box area (resting atop the z.one_{pro} System).
7. Lift the inner storage box upwards, and remove it from the main shipping container.
8. Grasping the sides, slide the cardboard main shipping box upwards, exposing the z.one_{pro} system. Continue lifting until the cardboard box can be completely removed, and set aside.



Figure 1: Main shipping container removal

9. Remove the clear packing tape that is used to secure the foldable wooden loading ramp in its upward-facing shipping position. Lower the ramp on its hinges.



Figure 2: Loading ramp lowering

10. Remove the clear packing tape that secures the front support to the base during shipping. Grasp the removable front support section of the wooden shipping base (at the bottom-front of the system), pull it directly outwards away from the z.one_{pro} system, and set aside.



Figure 3: Removable section of shipping base

11. Remove the plastic packaging bag to expose the z.one_{pro} system.



Figure 4: Removing protective storage bag

12. Locate the left front caster on the z.one_{pro} and press down on the upper black tabs to release the break. (Figure 8.2). You can leave the directional lock caster as is (right front/green)



**Figure 5.1 & 8.2 : Directional and Brake release
on wheels for z.one_{pro}**

13. Rotate the wheels from their 90 degree angled storage position, to be in line with the loading ramp and enable rolling the system out of crate.
14. Being careful to control the system's momentum, roll the z.one_{pro} system down the ramp, and out of crate.



15. Remove all protective plastic wrap and foam packaging materials.

16. If the trackball has been shipped separately (will be in a foam “basket” in the gel/transducer holder:



Remove the trackball cover ring from the trackball assembly by applying pressure with your fingers and turning counter clockwise. This will expose the retention ring which is removed by also turning counter clockwise. It should come out easy with finger pressure, but if it does not, you can use 2 pens (or other blunt objects) in the detents on either side of the retention ring for leverage.



Place the trackball in the assembly and reverse the steps to install the retention ring and trackball cover ring. Note: The retention ring has very thin threads, take care not to damage them during installation.

17. Inspect the entire z.one_{pro} system for damage, paying close attention to the LCD display on the Cart.

18. Move the z.one_{pro} system to the installation area.

Mechanical Inspection

- Ensure wheels and brakes function properly
- Raise and lower the Cart height adjuster (pull release lever located on the right of the system), to verify smooth operation and positive locking
- Ensure the LCD display monitor rotates and adjusts properly
- Ensure the z.one_{pro} module is securely attached in the Cart.
- Immediately report any mechanical discrepancies to ZONARE.

ZONARE MODULE COVER INSTRUCTIONS

WARNING



- *Ensure system is powered OFF.*
- *Place AC circuit breaker, located at the rear of the cart in the off "0" position.*



- *Disconnect the main AC power cord from the rear of the cart or unplug from the wall source.*
- *Ensure cart wheels are in the locked position.*



Fig 1



Fig 2

Step 1

The system is designed to power on only if the module cover is installed.

In order to install the cover correctly, attach the top portion first. Make sure the top edge of the cover is pressed in and sits under the top metal plate as in above photo Fig 1.

Step 2

Proceed to push the bottom half of the module cover in place by using thumbs to press on indented thumb tabs at bottom as in Fig 2 and push in until cover snaps in place. Plug in the power cord and switch the circuit breaker on the back in the ON position. Now press the power button at top of the module cover (Fig 1). The system should now start. If not, contact technical support.

1.

- Check to ensure all peripherals, software level, and serial numbers correspond with sales order. Make note of any missing items or discrepancies, and immediately report to ZONARE.

WARNING



To prevent possible damage to the electronics of the system from condensation, the following warning must be observed:

If the system has been subjected to an environment during shipping/transport that differs greatly in temperature and/or humidity, from the environment where it has been moved for installation/intended operation, the unit should be allowed to stand for a period of no less than 30 minutes prior to powering on.

NOTE:

The Module will normally come already installed in the cart when shipped. However if the Module is removed for any reason, refer to section 17 of this manual for installation instructions.

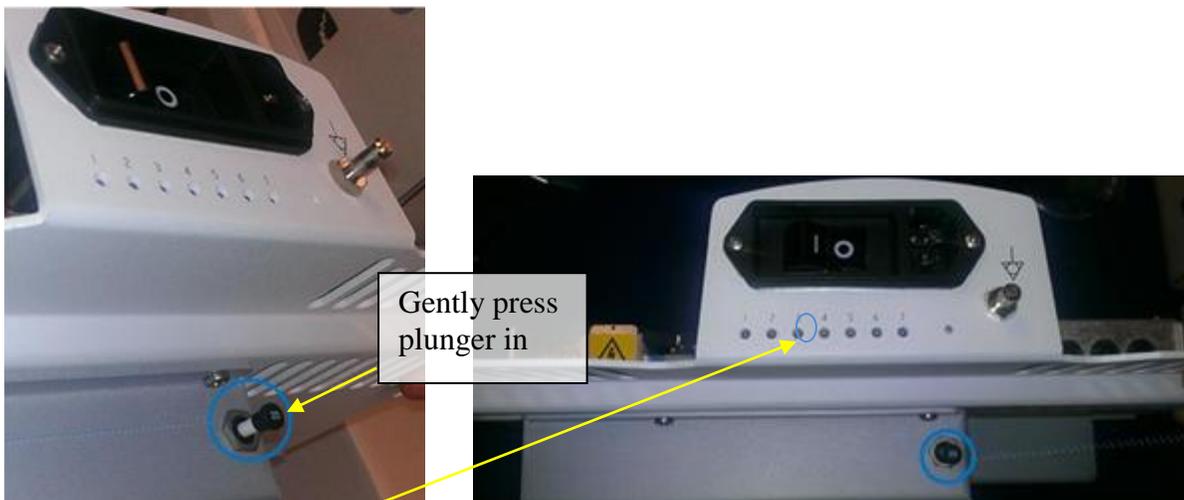
WARNING



To maintain the integrity of the electronic equipment within the z.one_{pro} ultrasound system, it is critically important that a specific sequence be followed at all times, for turning ON or OFF system power. The sequences listed below should always be followed.

z.one_{pro} System Verification

1. If the Z-PAK battery pack option is installed, the circuit breaker should come engaged (pressed in) from the factory. If it is not, the circuit breaker can be closed by 'gently' pushing the plunger straight into the pack. When the breaker is closed, the white ring around the plunger is not visible.



LED#3 will flash indicating the Cart Power microcontroller is operating.

2. Verify the socket of the AC power cord is fully inserted into the inlet in the back of the cart.
3. Connect the plug of the AC power cord into a Hospital Grade receptacle.
4. Make sure the AC Main Circuit Breaker on the z.one_{pro} System is in the “1” (**ON**, pushed in on the LEFT) position (see illustration below).



LED Status

1. LED #1 should illuminate indicating AC power is present.
2. LED #2 will flash if the cart battery is installed and charging.
3. LED #5 will illuminate indicating the main 24VDC supply is On

NOTE: *The z.one_{pro} ultrasound system has the ability to be powered by AC or battery (IF the Z-PAK battery pack “Option” is ordered). When fully charged the battery should allow for normal system operation up to 1.5 hours.*

5. Locate the grey power button at the top/right on the module. Press and release the On/Off button to power on the z.one_{pro} ultrasound system (as shown below).



On/Off Button Status

- The Green backlight for the button will begin to flash as the system boots-up.
- Once the system is booted, the Green Backlight will be steady On.
- Abnormal conditions will be indicated with an Amber colored backlight.

6. Verify that the System is functioning correctly by performing a basic test. This test is comprised of the following:
 - Attach a transducer (if not already connected)
 - Verify LCD display is functioning correctly by watching the boot and verifying that normal imaging is displayed after fully booted.
 - Verify Audio from the Display assembly – Enter PW, turn up the PW Gain and increase volume
 - Verify that the User Interface keys are functioning correctly
 - Test USB ports on front of system
 - Test and Verify Network Connectivity (if applicable)

- Test and Verify USB Peripheral Connectivity and Functionality (if applicable)

7. Verification is complete – return system to normal operation.

7 BASIC SYSTEM CONFIGURATION

Entering "Institution" Name

1. Press the "SETUP"  key on the User Interface and use the trackball to select **Tools** menu.

TOOLS Menu



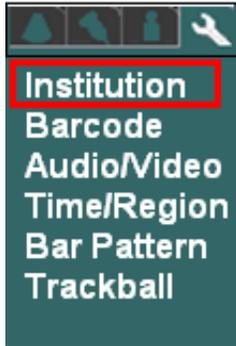
2. Using the trackball to backlight **SYSTEM SETUP** selection, and press one of the SET keys   to bring up this menu.

SYSTEM SETUP Sub-Menu



3. Within the **Display** selection, use the trackball to backlight **Institution** selection, press one of the Set keys   to bring up this menu.

DISPLAY Sub-Menu



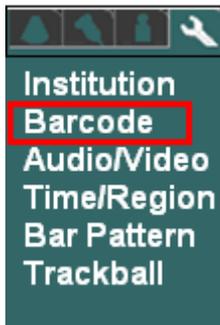
INSTITUTION Sub-Menu

- Using the alpha-numeric keyboard, enter Institution name (**Note:** Field is limited to 20 character positions)
- Place the arrow cursor over the **APPLY** soft-button displayed in this menu, and press one of the **SET** keys  to save new settings.

Configuring “Barcode” Scanner

- Within the **Display** selection, use the Menu Control to backlight **Barcode** selection, press one of Set keys  to bring up this menu.

DISPLAY Sub-Menu



BARCODE Sub-Menu

- Under the **Barcode Reader Device Assignment** pull-down menu, select the listed device corresponding to the active barcode reader currently attached to the USB ports on the system.
- Under the **Barcode Data Settings** pull-down menu, select the desired parameter to be linked to for tracking patient exams:
 - Patient ID**
 - Accession Number**

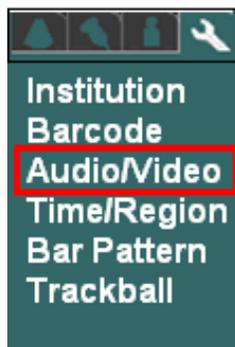
- **Operator ID**

3. If the system is setup to interface with a DICOM Worklist server for populating patient exam scheduling, check the “**Worklist Cache**” option , within the **Barcode Worklist Option** selection. Enabling this option will result in the system using the scanned-in barcode parameter (Patient ID, Accession Number, or Operator ID) for identifying the patient, to reference the cached Worklist data for auto-populating various fields in the Patient Information page.
4. Place the arrow cursor over the **APPLY** soft-button displayed in this menu, and press one of the **SET** keys  to save new settings.

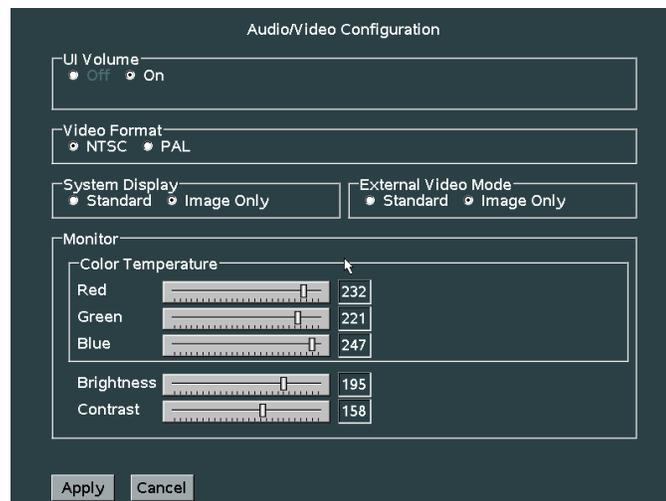
Configuring “Audio/Video”

1. Within the **Display** selection, use the Menu Control to backlight **Audio/Video** selection, press one of the **SET** keys  to bring up this menu.

DISPLAY Sub-Menu



AUDIO/VIDEO Sub-Menu



2. Select the desired A/V setup parameters from the menu. This is done by using the trackball to move the arrow pointer (in conjunction with the **SET** key), the **ENTER** key to make selections.

System Display Mode:

This selection configures the format of the on-screen video. The selections allow for increasing the amount of screen area used for the display of the main ultrasound image. This enables increasing/decreasing the size of the image to suit the User. The two external video format options available are:

- **Standard:** Standard image size with Dashboard and Thumbnail images displayed
- **Image Only:** Expanded image size (**1280 x 1024**) occupying entire 17” display (no Dashboard/Thumbnails shown)

3. **External Video Mode:**

This selection configures the format of the digital video that will be produced at the external HDMI connector (DVI video), on the rear panel of the system. The output format is configurable to allow for

matching the target peripheral device (external DVI monitor, etc). The two external video format options available are:

- **Standard:** 1280 x 1024 format (entire screen of z.one_{pro})
- **Image Only:** 800 x 600 format (image area only)

4. Once all the desired values have been selected, place the arrow cursor over the **APPLY** soft-button displayed in this menu, and press one of the **SET** keys  to save new settings.

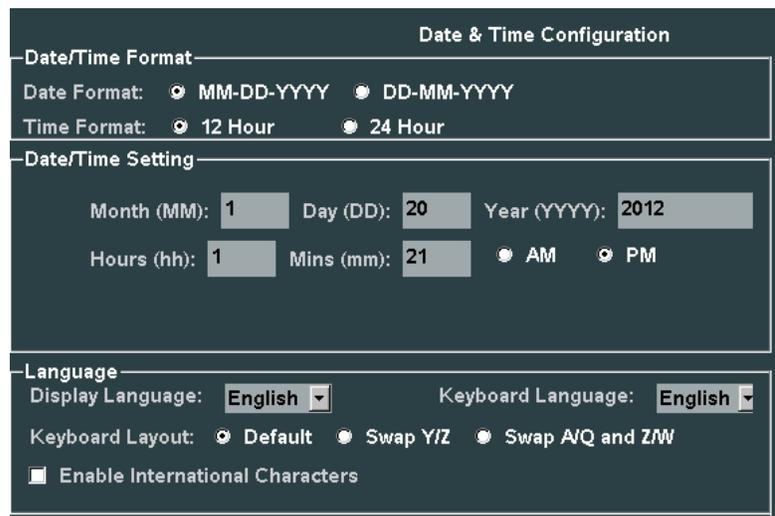
Entering “Time/Region” Information

1. Within the **Display** selection, use the Menu Control to backlight **Time/Region** selection, press one of the **SET** keys  to bring up this menu.

DISPLAY Sub-Menu



TIME (DATE) Sub-Menu



2. Using the alpha-numeric keyboard, enter in the current date/time information. The TAB key on the alpha-numeric keyboard is used for advancing to each successive field.
3. Place the arrow cursor over the **APPLY** soft-button displayed in this menu, and press one of the **SET** keys  to save new settings.

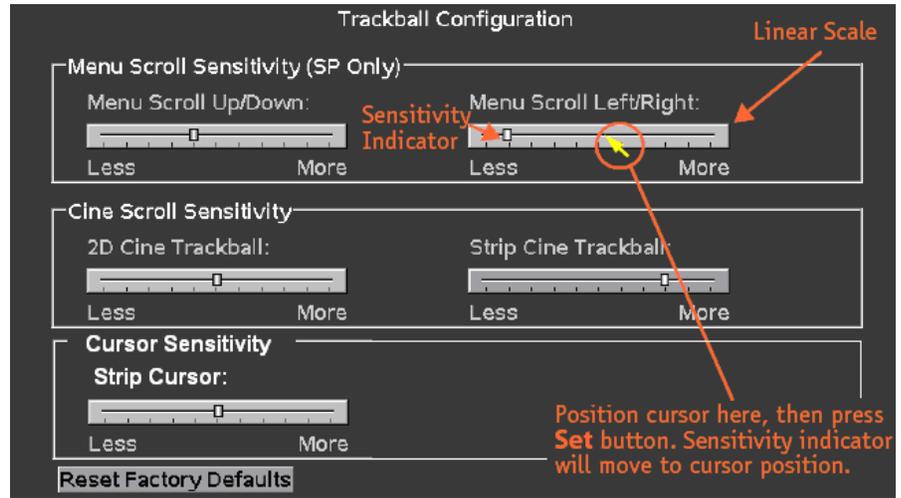
Entering "Trackball" Configuration

1. Within the **Display** selection, use the Menu Control to backlight **Trackball** selection, press one of the **SET** keys  to bring up this menu.

DISPLAY Sub-Menu



TRACKBALL Sub-Menu



Cine Trackball Configuration:

This menu allows for configuring the behavior of the trackball to users preferences, independently for a variety of Cine modes. The configurable usages are as listed below:

Menu Scroll Sensitivity

On the Cart, scrolling through menus and manipulating the settings for selected menu offerings can be performed using the trackball.

The following two configurable options allow for customizing the sensitivity of the trackball response during those menu operations on the Cart.

- **Menu Scroll Up/Down:**

Description: Threshold for speed of trackball movement by User when moving **up/down** through offered menu selections.

- **Menu Scroll Left/Right:**

Description: Threshold for speed of trackball movement by User when moving in a **left/right** direction, for altering the setting of a currently selected menu function.

Cine Scroll Sensitivity

- **2D Cine Trackball:** (B-Mode or B-Mode/Color modes)

Description: Controls the number of frames that are advanced in response to each sweep of trackball movement by the User.

- **Strip Cine Trackball:** (M-Mode or Spectral Doppler modes)

Description: Controls the rate at which the time axis sweep is advanced in response to each sweep of trackball movement by the User.

Cursor Sensitivity

- **Strip Cursor:** (PW/CW Doppler modes)

Description: Controls the sensitivity of the movement of the PW cursor line, via trackball movement by the User.

Reset Factory Defaults:

Description: Restores all trackball setting in this menu, for Cine access, back to factory defaults.

Configuring “Imaging” Parameters

1. Using the page trackball to advance menu screen to select **Tools** menu.

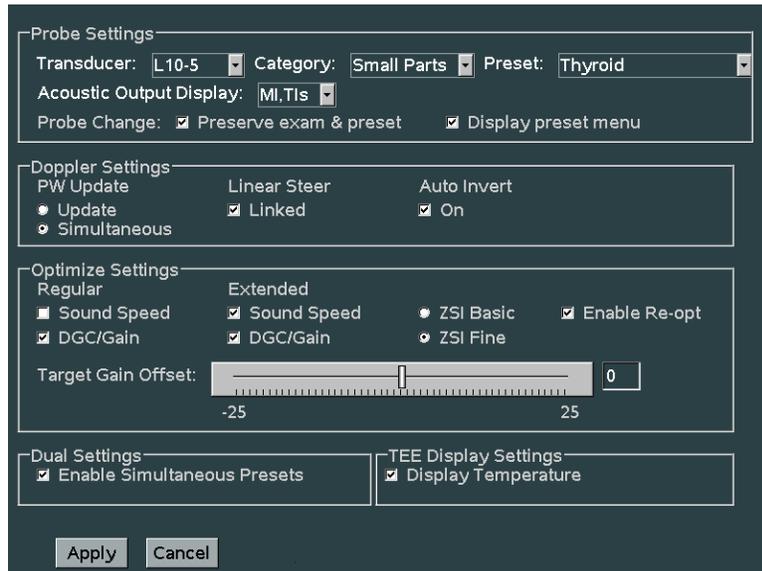
TOOLS Menu



2. Using the trackball scroll down to backlight **SYSTEM SETUP** selection, and press one of the **SET** keys  to bring up this menu, then select **IMAGING** sub-menu.

SYSTEM SETUP Sub-Menu

IMAGING Sub-Menu



1. For each Transducer type in the pull-down menu, configure the power-up default application type and preset type that are desired.
2. Select the desired behaviors to occur post transducer change:
 - **Preserve Exam & Preset** If checked, the system will retain the current Exam Type and Preset, when transitioning to selection of a different active transducer.
If unchecked, the system will use the user assigned default Exam Type and Preset for each subsequent transducer, as it is activated.
 - **Display Preset Menu** If checked, the OLED display panel will default to showing Exam Preset options in the windows, upon a transducer change.
If unchecked, the OLED display panel will default to showing transducer selection options in the windows, upon a transducer change
3. Select the desired default Doppler settings.
4. Select the desired default Auto-Opt/ZST settings
5. Select the desired “DUAL” mode preset behavior setting
6. Select whether TEE temperature sensor reading is desired for on-screen display
7. Place the arrow cursor over the **APPLY** soft-button displayed in this menu, and press one of the **SET** keys  to save new settings.
8. Repeat the process above for all additional transducer types.

“Media” & “Store/Print” Setup

1. Using the TAB button  advance the menu screen to select **TOOLS**
2. Using the **Menu Control**, arrow down to backlight the **Archive** selection, and press one of the **SET** keys  to bring up this menu.

SYSTEM SETUP Sub-Menu



ARCHIVE Sub-Menu



In addition to configuration of the Archive functions, the following operations are also accessed under this menu path.

- LOCATION (site) specific configuration
- Media storage configuration
- Store/Print button configuration
- DICOM setups
- Exam Export
- FTP Store settings
- Network
- Exam Management
- Serial Port/USB report configuration
- Ejecting of DVD/CD

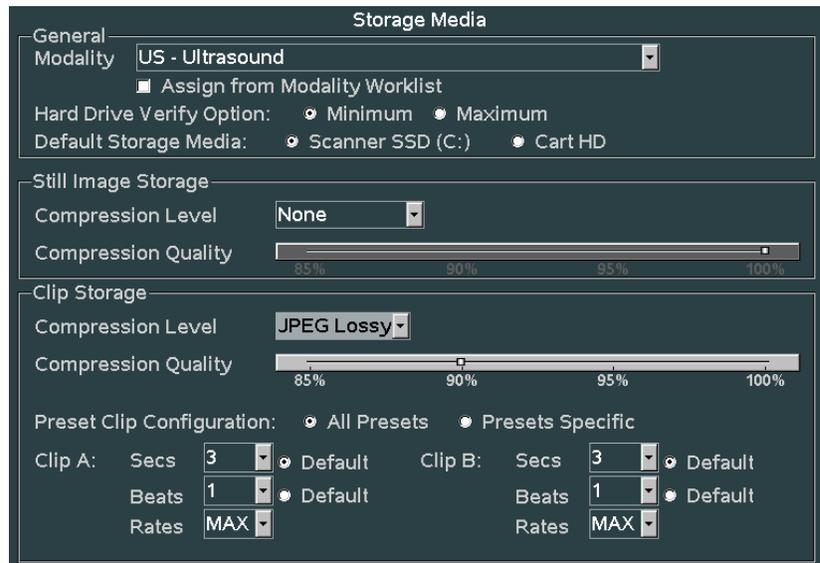
➤ “MEDIA” CONFIGURATION

1. Within the **ARCHIVE** selection, use the trackball to backlight **Media** selection, press one of the **SET** keys  to bring up this menu.

ARCHIVE Sub-Menu



STORAGE MEDIA Sub-Menu



2. Make any changes desired to the settings for still and clip image compression, and defined modality. In most cases using the factory default settings will perform well on a customer system.
3. To save the new settings, select **APPLY** from the main menu, and press one of the **SET** keys  to save new settings.

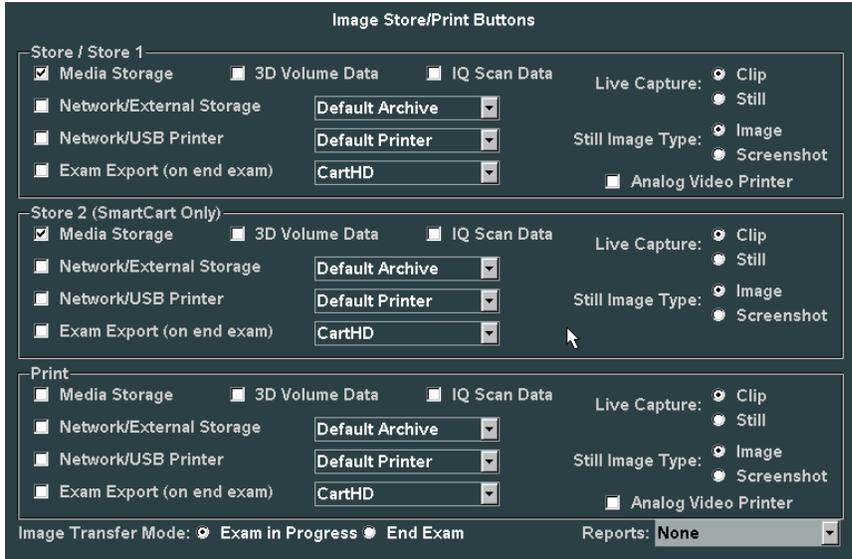
➤ **“STORE/PRINT” BUTTON CONFIGURATION**

1. Within the **ARCHIVE** menu, use the Menu Control to backlight **Store/Print** selection, press one of the **SET** keys  to bring up this menu.

ARCHIVE Sub-Menu



IMAGE STORE/PRINT BUTTONS Sub-Menu



2. Based upon what functions are desired to occur when the **PRINT**  and **STORE**  buttons on the z.one_{pro} are pressed, configure the settings in this menu.
3. In order to have the ability to transfer all aspects of the image data captured using the 3D technology transducer, the **“3D Volume Data”** box must be checked for the corresponding **STORE/PRINT** button.
4. In order to have the ability to capture raw IQ data images, the **“IQ Scan Data”** box must be checked for the corresponding **STORE/PRINT** button.
5. Using the **“Live Capture”** option, the **STORE/PRINT** buttons can be configured to disable capture of **“CLIP”** storage, in the case that the button is pushed while the system is **NOT** in **“Freeze”** mode.
 - **Clip** If checked, the system will capture live clips when the corresponding **STORE/PRINT** key is depressed while the system is in live imaging (**“Freeze”** not pressed) mode.
 - **Still** If checked, the system will **ONLY** grab a single still frame, when the corresponding **STORE/PRINT** key is depressed while the system is in live imaging (**“Freeze”** not pressed) mode.
6. Using the **“Still Image Type”** option, the **STORE/PRINT** buttons can be configured to determine the amount of display area that is captured when pressed.
 - **Image** If checked, only the ultrasound image window (800 x 600 area) is captured.
 - **Screenshot** If checked, the entire screen area (1280 x 1024), including the dashboard and thumbnail area, is captured.
7. Configure the **“Image Transfer Mode”** selection to reflect the desired image transfer behavior on the Customer’s system.

- **Exam in Progress:** Results in each new DICOM image immediately being placed into the DICOM Queue for transfer to the target network/print device, each time the corresponding STORE/PRINT key is depressed.
 - **Exam Completed:** Images are buffered during each STORE key depression, and later placed as a group into the DICOM Queue for network/print transfer. The process for beginning the transfer of the images is automatically started when the Operator ends the current exam.
8. **Reports:** If SR (Structured Report) sending was enabled on the Network Store page for any PACS devices, select the desired target device in the pull-down menu.
9. To save the new settings, select **APPLY** from the main menu, and press one of the **SET** keys  to save new settings.

“Exam Export” Options

The **EXAM EXPORT** menu allows for configuring the formatting (Compression, Color Model, etc) for images “**Exported**” to the target media device.

Press Setup and use the trackball to advance menu screen to select **TOOLS** menu; then select **SYSTEM SETUP**, then select **ARCHIVE**.

SYSTEM SETUP Menu

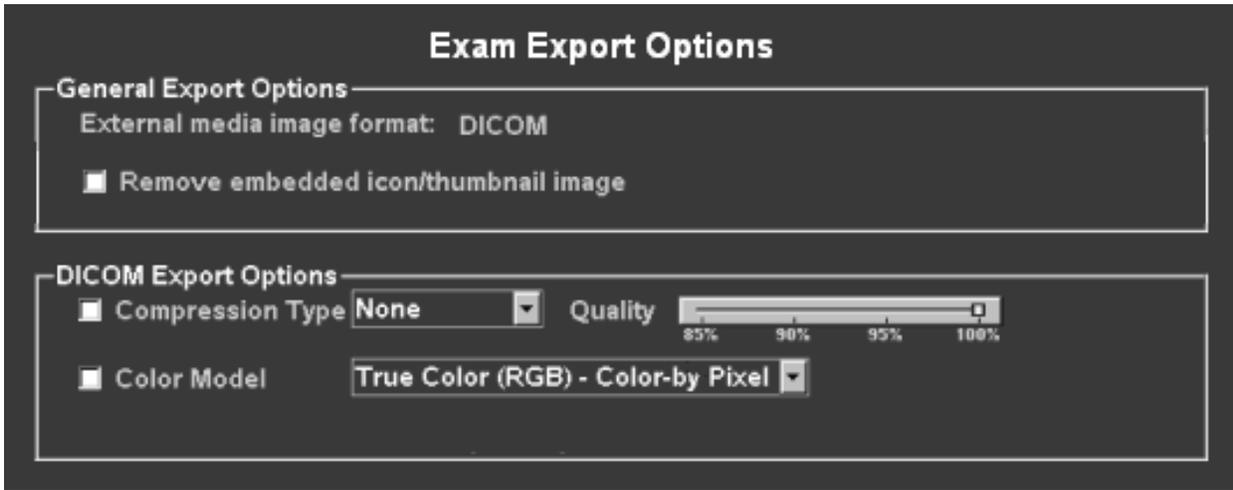


ARCHIVE Menu



7. Use the **trackball and scroll** down to backlight **EXAM EXPORT** selection, and press one of the **SET** keys  to bring up this menu.

EXAM EXPORT Sub-Menu



8. Configure the Exam Export Options settings to reflect the desired formatting for the target images upon export.

9. To save the new settings, select **APPLY** from the main menu, and press one of the **SET** keys  to save new settings.

“Exam Management” Setup

The **EXAM MGMT** menu allows for configuring the functionality of the system when “**Restarting**” exams, and also provides access to low-level service functions for managing a variety of Archive media.

1. Use the Setup button and trackball to advance menu screen to select **TOOLS** menu; then select **SYSTEM SETUP**, then select **ARCHIVE**.

SYSTEM SETUP Menu



ARCHIVE Menu



2. Using the **trackball and scroll** down to backlight **EXAM MGT** selection, and press one of the **SET** keys  to bring up this menu.

EXAM MGMT Sub-Menu

Patient Exam Management

Setup

Exams are restarted using: Prior Series New Series

Note: DICOM MPPS is disabled; however, enabling DICOM MPPS requires images to be stored in a new series.

Maximum age of exams for restarting: 1 Day 2 Days 1 Week
 1 Month Unlimited

Rebuild patient exam database content: Minimum Complete

Patient exam database rebuild helper files: Create/Update Read

Rebuild patient exam database: Scanner SSD (C:) [v] Rebuild

Erase all patient data: Scanner SSD (C:) [v] Erase

Format storage media: Scanner SSD (C:) [v] Format

Diagnostics: Minimum Full Scanner SSD (C:) [v] Run

Study Description Option: Auto update

3. Configure the “*Exams are Restarted Using*” selection to reflect the desired grouping of images upon restarting of a previous exam on the Customer’s system.

- **Prior Series:** Appends new images onto the series of images previously captured.

IMPORTANT



“*Prior Series*” selection is *NOT* available (“*New Series*” only) if the system has an active DICOM MPPS server enabled on the DICOM MPPS configuration page.

- **New Series:** Creates a new series of images, utilizing only the Patient info from the earlier exam series.
4. Configure how many days prior to the current date that the Users will be allowed to “**RESTART**” (add/delete images) internally archived patient exams.
 5. Select the granularity desired when initiating patient exam database rebuild operations.
 6. Using the **Menu Control**, arrow down to backlight **Apply** selection in the main menu, and press the SELECT button  to save any exam “RESTART” configuration setup changes, and exit

ARCHIVE SERVICE FUNCTIONS:

WARNING



Due to the deletion of the original (assumed corrupted) database file during the “**REBUILD PATIENT EXAM DATABASE**” process, it should be noted that Patient information updates made to initially started exams (i.e. changing Patient name info, etc, after the first image for a study has already been

stored) will only be retained in post-rebuilt exam, if the “READ” option for the Helper files is “unchecked”.

➤ **Rebuild Patient Exam Database - Content:**

This option allow for specifying the granularity of the exam database rebuild process that is initiated with the “**REBUILD**” menu selection below.

*NOTE: The exam database content granularity selections (described below) does **not** have any effect (is not applicable) for rebuilds where the targeted device (via the pull-down selection) is an “External” media (i.e. USB memory sticks, CD/DVD, etc) device.*

- **Minimum:** Rebuilds the study/exam table ONLY. Additional rebuilding, of the other tables, will occur later, as each individual study is accessed. (fastest)
- **Complete:** Completely rebuilds all exam database tables, including exam/study table, series table, image/IQ/key image note table. (longer)

➤ **Patient Exam Database Rebuild “Helper” Files:**

These settings allows for specifying how the database “Helper” files will be affected/utilized, when the “**REBUILD**” operation is performed.

NOTE: Default is both boxes selected (“checked”):

- **Read:**
 - When **checked:** Tells the system to look for (read) the existence of a valid single “**HELPER**” file (most current patient/exam information for entire study) for each exam, and use its content exclusively for the database rebuild operation (fastest)
 - When **unchecked:** The system will scan all files in each exam folder, looking for the most current data to be used for creation/update of the “HELPER” file. (longer)
- **Create/Update:**
 - When **checked:** Instructs the system to generate a current “**HELPER**” file for each exam, during the execution of the “Rebuild” process. Once completed, subsequent “Rebuilds” should run much more quickly (as long as the “**READ**” option box is also checked)
 - When **unchecked:** The system will not create or make any updates to existing “HELPER” files, when the “Rebuild” operation is performed.

➤ **Rebuild Patient Exam Database:**

Clicking on this menu item initiates the database “Rebuild” process. The “Rebuild” process is intended to be used in cases where exam access to the patient image ARCHIVE of the internal exam storage, or other archive media (remote USB media, CD/DVD, etc) becomes problematic.

Selecting the “**REBUILD**” box will regenerate the database’s index file (directory) and potentially resolve the problem. Select the desired media device, using the provided pull-down menu, prior to initiating the “Rebuild” process.

➤ **Erase All Patient Data:**

WARNING



Initiating the “**ERASE**” function will completely delete ALL patient exams (all stored images) on the internal ARCHIVE storage. **DO NOT perform this function** unless the system’s User has confirmed that all needed exams/images have been exported/transferred to another medium, or are no longer needed.

Due to this operation performing individual “deletes”, the “ERASE” operation may take an extended period of time to complete if the selected Archive media contains an extensive number of patient exams.

In extreme cases where the system is totally unable to access the ARCHIVE on either the system or other media (USB media, etc.), selecting the “**ERASE**” function will completely clear (erase) the following:

- All stored patient exams (images)
- All patient exams pending DICOM transfer in DICOM QUEUE (if C drive selected)

Select the desired media device using the provided pull-down menu.

➤ **Format Storage Media:**

NOTICE



Initiating the “**FORMAT**” function will result in removing ALL of the contents of the target media device.

- Patient exams
- System Logs
- DICOM Queue jobs
- Some Transducer file

To prevent Users from accidentally performing this operation a “Service Password” prompt will appear prior to this “FORMAT” operation activating. Contact Mindray Technical Support in order to obtain the service password and assistance with this operation.

Due to the erasing of some transducer files, reloading of system software will be required after performing this “FORMAT” operation.

In extreme cases where the system is totally unable to access the internal storage media or other media (USB media), selecting the “**FORMAT**” function will completely reformat the media; erasing all contents. Due to the operation being a complete” **FORMAT**” where no individual files are accessed, it is completed very quickly.

Select the desire media device using the provided pull-down menu.

➤ **Diagnostics:**

The diagnostic function provides the ability to perform a database screening of the selected archive media device to verify its integrity. The media devices available for diagnostic testing are:

- **Cart SSD (J:) – Solid-state Drive**

Two different options are offered to define the granularity level of the diagnostic testing.

- Minimum:**.....Basic level diagnostic screening of target media device (quick)

- Full:**Comprehensive screening of target media device (longer)
-

➤ **Study Description Option:**

- Auto Update**

The “Auto Update” option being selected results in the “**Study Description**” field (DICOM Tag: **0008,1030**), on the Patient Demographics page, being automatically populated with source information provided from the DICOM Worklist server (if info is provided).

If no auto-populated source information is provided for this field (or this box is unchecked), the information can be manually entered by the User on the Patient Demographic page.

Archive “Export” Options

The EXPORT function on the ARCHIVE page includes a special **OPTIONS** page. This page allows for customizing the steps that will be performed, and the data formatting, that will occur during the export. The export options are as shown in the menu below:

Exam Export Options

General Export Options

External media image format: DICOM Non-DICOM

Hard Drive Verify Option: Minimum Maximum

CD/DVD Verify Option: On Off

Remove embedded icon/thumbnail image

Close CD/DVD Session

Remove identity of patient(s)

Assign a unique patient identity to each exam (DICOM only)

Assign a common patient identity to all exams (DICOM only):

Patient's Name: Last: First:

Patient ID:

DICOM Export Options

Compression Type **None** Quality

Color Model **True Color (RGB) - Color-by-Pixel**

Include DICOM structured report (if possible) SR Private Data

Non-DICOM Export Options

Still image file format JPEG TIFF

Include patient name in export folder name (not for CD/DVD)

Zip exported exam folders

• **General Export Options**

• **External Media Image Format:**

- DICOM: Exam data stored on output device in native DICOM format (may be re-imported later).
- Non-DICOM: Exam data stored on output target device in a non-DICOM (cannot be re-imported or viewed on ZONARE) format, as selected in non-DICOM export option area.

• **Hard Drive Verify Options:**

- Minimum: Basic level checksum verification only (fastest)
- Maximum: Full file system data verification (longest)

• **CD/DVD Verify Options:**

- On: Comprehensive data validation operation at end of data export (longest)
- Off: No advanced data validation, but basic data checking still performed (fastest)

• **Remove embedded icon/thumbnail image:**

When checked, the small icon/thumbnail images will be removed from all images

- **Remove Identity of Patients:**
 - Assign a unique patient identity to each exam (DCOM only):
 - Assign a common patient identity to each exam (DCOM only):
-

- **DICOM Export Options**

- **Compression Type:**
 - Pull-down menu selection of different data compression (file size reduction) options
 - **Color Model:**
 - Pull-down menu selection of different options for color mapping data format
-

- **Non-DICOM Export Options**

- **Still Image File Format Type:**
 - JPEG: Saves images as JPEG standard computer format
 - TIFF: Saves images as TIFF standard computer format
 - **Include Patient Name in Export Folder:**
 - When checked, the export folder naming convention will include patient name
 - **ZIP Exported Exam Folders:**
 - When checked, WINZIP compression of the final exam folder will be performed:
-

In extreme cases where the system is totally unable to access the ARCHIVE on system drive or other media (USB media), selecting the “**ERASE**” function will completely clear (erase) the following:

IMPORTANT



For use of DVD media type for Exports, only one brand/model of DVD media has been tested and approved to be compatible for use with the ZONARE system. The approved DVD media type is as listed below:

- **Taiyo Yuden** brand DVD media ONLY!

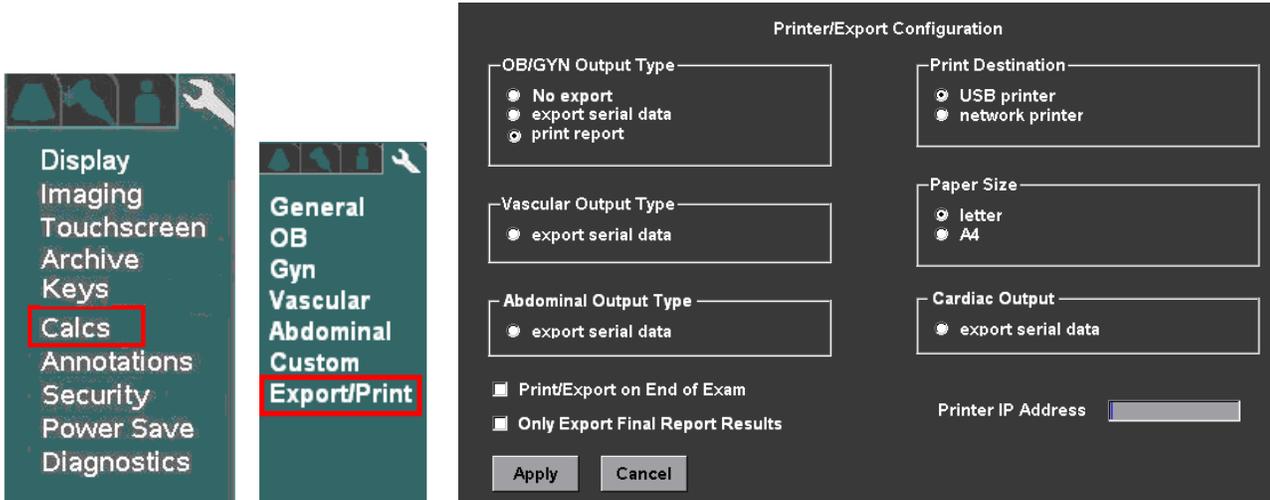
“Serial Port” Setup - (Export Calc Report Data)

The **SERIAL PORT** configuration menu allows for configuring the system to be able to “EXPORT” report data to 3rd-Party external report generator equipment, via a “**USB**” port connection on the system.

The three (3) *types* of Calc report data that can be exported, via the USB ports, are as listed below. Configuring which report type(s) will be exported is performed on the **SYSTEM SETUP ->CALCS -> EXPORT/PRINT** menu.

- **OB/GYN** Calc Output
- **VASCULAR** Calc Output
- **CARDIAC** Calc Data

System Setup -> Calc -> Export/Print

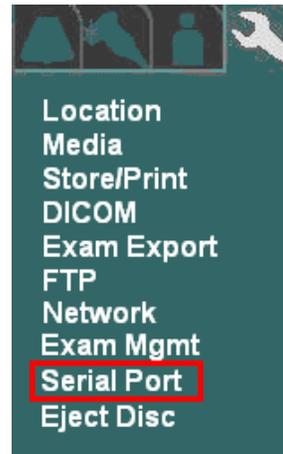


1. Use the Setup button and trackball to advance menu screen to select **TOOLS** menu; then select **SYSTEM SETUP**, then select **ARCHIVE**.

SYSTEM SETUP Menu



ARCHIVE Menu

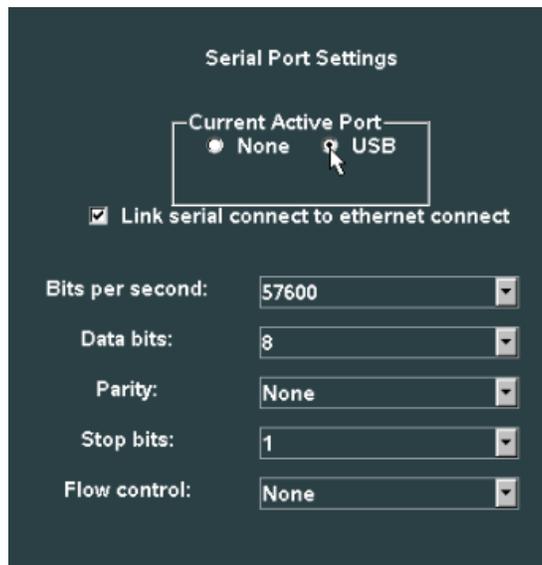


2. Using the trackball scroll down to backlight **SERIAL PORT** selection, and press one of the **SET** keys



to bring up this menu.

SERIAL PORT Sub-Menu



3. If desired, check the box to select the **USB** port as the target for EXPORT function of OB/GYN report data.
4. If desired for report data to be exported in sync with DICOM image transfers to the PACS system over the network, check the box for “Link Serial Connect to Ethernet Connect”.
5. Using the **Menu Control**, arrow down to backlight **Apply** selection in the main menu, and press one of the **SET** keys  to save the serial port configuration setup, and exit

Overview

Prior to system installation at any medical facility utilizing a **DICOM** network environment, a “Pre-Install Survey Form” (ZONARE P/N: F00044) should have been completed. This form is used for obtaining, in advance, detailed networking and **DICOM** configuration values (IP addresses, AE Titles, etc.) from the **IT/PACS System Administrator** at the facility. These site-specific values/parameters are required prior to programming the entries in the DICOM configuration menus on the system.

A copy of this “Pre-Install Survey Form” is included on the following pages, as a backup resource.

IMPORTANT



Once all of the DICOM parameters have been configured into the required DICOM setup menus, it will be necessary to power down and reboot the system in order to initialize the new network connections with the target devices.

z.one_{pro} Network Address Info Requirements:

The following information, defining the system’s identity on the local network at the medical facility must be assigned *by the facility’s IT/PACS Network Administrator*, prior to beginning the setup of the **DICOM** configuration menus on the system.

<u>Definition</u>	<u>Assigned Value</u>	<u>Example Only</u>
• z.one _{pro} (IP Address):	_ _ _ . _ _ _ . _ _ _ . _ _ _	10.94.1.105
• z.one _{pro} (Gateway Address):	_ _ _ . _ _ _ . _ _ _ . _ _ _	10.94.1.1
• z.one _{pro} (Subnet Mask):	_ _ _ . _ _ _ . _ _ _ . _ _ _	255.255.255.0

Parameter Definitions

The table below provides some guidance regarding the type of information required for the DICOM configuration of the various menus (“**General**”, “**Printers**”, “**Network Store**”, “**MPPS**” and “**Worklist**”) on the system.

DICOM Configuration	Definition:
AE Title e.g., “Zonare1”	The official “name” (<i>Application Entity</i>) assigned to the system (by the network administrator) to identify it on the network.
Association Acceptor	Configuration options to enable cases where the z.one _{pro} is desired to be configured to serve as a DICOM host for accepting DICOM association requests and store requests from other DICOM devices
Color Model	Defines the method that will be used (Grayscale, RGB color, etc.) by the receiving device (DICOM PACS system) for interpreting the different bit level values of the data, within the transferred images Selections include: - Palette Color - True Color (RGB) - Color by Pixel - True Color (RGB) - Color by Plane - Grayscale (Monochrome2)
Compression - None - RLE Lossless - JPEG Lossy	Enables the ability to compress image files for the purpose of reducing file size and transfer times. RLE Lossless automatically reduces the size of the transferred image, yet retains all source content. Provide the highest level of image file size reduction (compression) of all the options. User selectable “Quality” setting (between 85-100%) determines resultant file size.
Date Range	Specify the number of days back (Today, 2, 7, All) that the DICOM worklist will reference scheduled examinations.
Enable Debug (Structured Reports)	Activates a function where a copy of the SR report file (with patient info filtering) is captured to the Log file directory, for SR transfers (service)
Filter Cached Entries	Checking box results in same modality type (i.e. US, XA, etc) filtering of the downloaded worklist superset when system is off network and worklist sourced from cached file
Gateway IP Address	A designated TCP/IP address (i.e 10.1.1.254) that is required in cases where the system is to be connected to target devices that are outside the primary host network (FTP remote access, for example).
ICON Image	A sub-sampled (miniature size) version of the image created for each patient image on the system . Options are to either <i>retain</i> or <i>remove</i> these images from DICOM image transfers to the target device. (default is “ <i>retain</i> ”)
IP address	Internet Protocol address. A unique Internet address for devices attached to an IP network (TCP/IP network).
Keep Alive Timeout	Specify the duration (in seconds) that an established DICOM connection will be maintained, after completion of the last transfer.
Key Image Note/Key Object Selection Document	Specifies the sending of Key Image Note electronic “Post-It” note info, as Key Object Document content during the DICOM-DICOM SR transfers to the PACS system.

DICOM Configuration	Definition:
Limit by Modality <ul style="list-style-type: none"> – None – US (ultrasound) – 50+ additional options: (see list of selections) 	Filtering by modality (US, CT, MRI, et cetera) of scheduled patient examination data generated by the Worklist server. Set according to department requirements. None: Show entries for <i>all</i> modalities. US: Show entries for <i>ultrasound</i> exams only. The following additional modality filter (limit) settings are available for selection: Selections – AU, BI, CD, CR, CT, DD, DG, DX, ECG, EPS, ES, FID, GM, HC, HD, IO, IVUA, KO, LS, MG, MR, NM, OP, OT, PR, PT, PX, REG, RF, RG, RTDOSE, RTIMAGE, RTPLAN, RTRECORD, RWV, SM, SMR, SR, ST, TG, US, XA, XC
Log Level	Defines the level of detail information that will be displayed in the DICOM Queue.
Maximum entries cached Enter a number between 0 and 999	Set according to department requirements. A higher number provides access to more scheduled exams, but increases the time required to search for the exam of interest.
Minimum/Maximum Film Density	For defining Minimum/Maximum density of images on film. Value entered is expressed in hundredths of OD (optical density). A value entered of 150, corresponds with 1.5 OD. Typical acceptable values to be entered are 000-399, with 020 (for “Min”) and 300 (for “Max”) being a potential starting point.
Network Type	Allows for manual or auto setup of network speed and duplex operational state. Selections include: Auto-Negotiate, 100MB/Full-Duplex, 100MB/Half-Duplex, 10MB/Full-Duplex, 10MB/Half-Duplex
Nickname e.g., “Prep Room Printer”	An informal name to identify the device to users in the department. This name is typically assigned in the department.
Network Usage Type	Defines the interval at which DICOM images will be transferred over the network to the PACS storage device. Either immediately upon each press of STORE (“Exam in Progress”), or at the termination of the current examination (“Exam Completed”). <ul style="list-style-type: none"> - Exam In Progress - Exam Completed
No Color	If selected, images that are captured when the z.one _{pro} is being operated in modalities where no “Color” is present (B-Mode, PW Doppler, M-Mode), will be transferred to the receiving DICOM device (Network Store system) as “Grayscale-Monochrome2.” Despite this “No Color” selection being active, all images captured while in Color Doppler mode will still be transferred to PACS using the color map selected in the <i>Color Model</i> field.
PDU Receive/Send Size	The size (in bytes) of the basic data packets (PDU: Process Data Unit) that will be transferred during receive and transmit operations. (default is 16384 = 16K)
Pixel Spacing	Adds ability to assign CT/MR-specific pixel spacing to ultrasound images sent to PACS, to allow for calibrating pixels to millimeters for measurements.
Polling Interval (minutes) <ul style="list-style-type: none"> – None – choose minutes 	The frequency of automatic updates to the worklist. A short polling interval may impact system performance. Choose a preferred interval; or choose None to update the worklist only on demand.
Port number	The TCP/IP port number that is being used by the DICOM device connected to the system. Default port value is 104.
Queue Timeout (sec)	The maximum amount of time that a DICOM job will remain active in the queue, before it times out.
Queue Start Type	Defines whether the start of jobs in the DICOM queue will be performed

DICOM Configuration	Definition:
	<i>automatically</i> or started <i>manually</i> .
Reconciliation	For exams NOT YET sent to PACS. Specifies that the system will interrogate the patient information from the last stored image, prior to sending that exam to DICOM PACS device. For images in that exam having differing information, the system will reconcile (correct) those values in the DICOM headers prior to sending.
Release Association	Specifies whether to release the DICOM association (communications link between the z.one _{pro} and the DICOM storage device) after each individual image is transferred or maintain it until the entire exam is completed.
Remove Attributes	Specifies any DICOM attributes (i.e. Soft Tissue Thermal Index) that are desired to be removed from the DICOM image header transferred with stored images. This function is provided to allow compatibility with all DICOM target devices.
Scheduled Station AE Title	Identity (Application Entity Title) assigned to the ZONARE ultrasound system, for use in filtering patient exam scheduling data provided by the Worklist server. Value to be provided by PACs Admin, to meet department requirements.
SR Emulation - (<i>special license req.</i>)	Special feature (license file option required) for forced populating three fields in DICOM header for SR output to enable acceptance by Siemens "SYNGO" PACS - (0018,1020) Software Version(s) -- PMS5.1 Ultrasound iU22_4.0.1.1 - (0020,000E) Series Instance UID -- 1.2.840.113663.1500.1.xxx - (0008,0018) SOP Instance UID -- 1.2.840.113663.1500.1.xxx
SR Private Data	Include raw serial calc data as DICOM "Private Element" content, with SR data exported
Station Name	The user-friendly Host name that will be assigned to the system for identification on the local network. Should be provided by the Network Administrator.
Subnet Mask	The number of bits (within the 24-bit IP Address) that will be used for defining the "Network" portion vs. the "Host" portion of the TCP/IP address.
TCP Timeout (sec)	The maximum duration (in seconds) of waiting time that will be allowed for completion of transfers over the network. Set according to anticipated network type/ speed.

Pre-Install Survey Form

DICOM Connectivity Type at Customer Site: (Check boxes below, as applicable: **Required**)

DICOM™ Network Store™	DICOM™ MPPS™	DICOM™ Printer Only™	DICOM™ Worklist™	No DICOM
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Network Setup Parameters

Level	Parameter Name	User Site Value/Setting	Default / Special Info
Required	TCP/IP Address acquisition method	Obtain Automatically (DHCP) Use Specified	<i>Obtain Automatically</i>
Required	Use Specified (IP Address, if fixed)		
Required	Gateway IP Address (IP Address, if fixed)		
Required	Subnet Mask (IP Address, if fixed)		
Required	Ethernet Media Type (Speed/Duplex)	Auto Select 100MB/Full-Duplex 100MB/Half-Duplex 10MB/Full-Duplex 10MB/Half-Duplex	<i>Auto Select</i>
Required	MTU (size)		<i>1500</i>
<i>Service</i>	Wireless Bridge (Service-Support)	5. IP Address: _____ 6. Username: _____ 7. Password: _____	<i>Service option</i>

General System / DICOM Setup Parameters

Level	Parameter Name	User Site Value/Setting	Default / Special Info
<i>User option</i>	Application (AE) Title – (Zonare System)		<i>ZONARE</i>
<i>User option</i>	Station Name – (Zonare System)		<i>ZONARE</i>
<i>User option</i>	TCP Timeout (sec.)		<i>30</i>
<i>User option</i>	Queue Timeout (sec.)		<i>120</i>
<i>User option</i>	Queue Start Type	Automatic Manual	<i>Automatic</i>
<i>User option</i>	Keep Alive Timeout (sec.)		<i>3600</i>
<i>User option</i>	Association Acceptor	<input type="checkbox"/> Port <input type="text" value="104"/> <input type="checkbox"/> Storage	<input type="checkbox"/> <input type="checkbox"/> <i>both unchecked</i>
<i>User option</i>	Log Level	Selections: (Normal , None, Debug)	<i>Normal</i>
<i>User option</i>	Structured Reports – Debug	<input type="checkbox"/> Enable Debug	<i>unchecked</i>

Printers (DICOM) Setup Parameters (if applicable)

Level	Parameter Name	User Site Value/Setting	Default / Special Info
Required	Nickname - (Printer)		
Required	Application (AE) Title – (Printer)		
Required	IP Address (Printer)		
Required	Port Number		<i>104</i>

Level	Parameter Name	User Site Value/Setting	Default / Special Info
User option	Max PDU Receive Size		16384
User option	Max PDU Send Size		16384
User option	Color Mode	Color Grayscale	Color
User option	Number of Copies		1
User option	Print Priority	Low Med High	Med
User option	Image Display Format	Selections: (2x2 , 1x1, 1x2, 2x1, 2x3, 3x2, 3x3, 3x4, 3x5, 4x3, 4x4, 4x5, 4x6, 5x4, 5x5, 5x6, 5x7)	2x2
User option	Medium Type	Default Low Medium High	Medium
User option	Film Orientation	Default Portrait Landscape	Portrait
User option	Film Size	Selections: (Default, 8x10 , 8.5x11, 10x12, 11x14, 11x17, 14x14, 14x17, 24cm x 24cm, 24cm x 30cm, A4, A3)	8x10
User option	Trim	Default Yes No	Yes
User option	Min Film Density	Typical acceptable value range – (000-399)	
User option	Max Film Density	Typical acceptable value range – (000-399)	
User option	Border Density		Black
User option	Empty Image Density		Black
User option	Magnification Type	None Replicate Bilinear Cubic	Cubic
User option	Smoothing Type		

Network Store (DICOM) Setup Parameters (if applicable)

Level	Parameter Name	User Site Value/Setting	Default / Special Info
Required	Nickname - (PACS Server)		
Required	Application (AE) Title - (PACS Server)		
Required	IP Address - (PACS Server)		
Required	Port Number		104
User option	Max PDU Receive Size		16384
User option	Max PDU Send Size		16384
User option	Color Model	Palette Color Grayscale True Color (RGB) – Color-By-Pixel True Color (RGB) – Color-By-Plane	Palette Color
User option	No Color	No Color	<input type="checkbox"/> unchecked
User option	Remove Attributes	Selections: (iICON Image Sequence, Sequence of Ultrasound Regions, Output Power, Mechanical Index, Bone Thermal Index, Cranial Thermal Index, Soft Tissue Thermal Index, Soft Tissue Focus Thermal Index, Soft Tissue Surface Thermal Index, Depth of Scan Field,	iICON Image Sequence
User option	Pixel Spacing	Assign non-US pixel spacing from 2D US region	<input type="checkbox"/> unchecked

Level	Parameter Name	User Site Value/Setting	Default / Special Info
User option	Reconciliation	Reconcile patient/exam information - Rewrites Patient Info into all images in exam, based on last frame stored, prior to re-send to PACS	<input type="checkbox"/> unchecked
User option	Object Type	Still/Single-Frame Image Cine/Multi-Frame Image IQ Scan/Raw Data SR Document SR Private Data SR Emulation (special option) Key Image Note/Key Object Selection Document	Always checked (grayed) <input type="checkbox"/> unchecked <input type="checkbox"/> unchecked <input type="checkbox"/> unchecked <input type="checkbox"/> unchecked <input type="checkbox"/> unchecked
User option	Release Association	After storing each image in the exam After storing the entire exam	After storing each image

MPPS (Modality Performed Procedure Step - DICOM) Setup Parameters (if applicable)

Level	Parameter Name	User Site Value/Setting	Default / Special Info
Required	Nickname - (MPPS Server)		
Required	Application (AE) Title – (MPPS Server)		
Required	IP Address (MPPS Server)		
Required	Port Number		104
User option	Max PDU Receive Size		16384
User option	Max PDU Send Size		16384

Worklist (DICOM) Setup Parameters (if applicable)

Level	Parameter Name	User Site Value/Setting	Default / Special Info
User option	Nickname - (Worklist Server)		
Required	Application (AE) Title - (Worklist Server)		
Required	IP Address – (Worklist Server)		
Required	Port Number		104
User option	Max PDU Receive Size		16384
User option	Max PDU Send Size		16384
User option	Scheduled Start Date	Today Last 2 Days Last 7 Days All	Today
User option	Scheduled Modality	US None Selections – Circle one if desired: (AU, BI, CD, CR, CT, DD, DG, DX, ECG, EPS, ES, FID, GM, HC, HD, IO, IVUA, KO, LS, MG, MR, NM, OP, OT, PR, PT, PX, REG, RF, RG, RTDOSE, RTIMAGE, RTPLAN, RTRECORD, RWV, SM, SMR, SR, ST, TG, US, XA, XC)	US
User option	Scheduled Station AE Title		
User option	Automatic Query Type (Minutes)	Selections: (1, 3, 5 , 10, 15, 30, 60, Disabled)	Every 5 Minutes

Level	Parameter Name	User Site Value/Setting	Default / Special Info
User option	Maximum Entries Cached		200
User option	Filter Cached Entries	Filter Cached Entries	On (checked)
User option	Query on Display	Query on Display	Off (unchecked)

Media – Storage Setup Parameters

Level	Parameter Name	User Site Value/Setting	Default / Special Info
User option	General: Modality	Selections – Circle one if desired: (AU, BI, CD, CR, CT, DD, DG, DX, ECG, EPS, ES, FID, GM, HC, HD, IO, IVUA, KO, LS, MG, MR, NM, OP, OT, PR, PT, PX, REG, RF, RG, RTDOSE, RTIMAGE, RTPLAN, RTRECORD, RWV, SM, SMR, SR, ST, TG, US , XA, XC)	US
		Assign from Modality Worklist	<input type="checkbox"/> unchecked
User option	Still Image Store: Compression Level	None RLE Lossless JPEG Lossy	None
User option	Still Image Store: Compression Quality (active only IF “JPEG Lossy” selected)	(85% - 100% selectable)	n/a
User option	Cine Image Store: Compression Level	None RLE Lossless JPEG Lossy	JPEG Lossy
User option	Cine Image Store: Compression Quality (active only IF “JPEG Lossy” selected)	(85% - 100% selectable)	90 (%)

Other DICOM/Network Related Behavior - Settings

Level	Parameter Name	User Site Value/Setting	Default / Special Info
User option	MPPS Destination	Enable Disabled	Disabled
User option	Worklist Destination	Enable Disabled	Disabled
User option	Image Transfer Mode	Exam In Progress Exam Completed	Exam In Progress

“DICOM” Configuration Procedure - Menus

NOTE: Refer to the “Survey Form” (on the previous pages), for detailed information of all the values that are offered in the z.one_{pro} menus, for selection within the various fields, in each of the following configuration screens.

➤ **SITE SPECIFIC ”LOCATION” CONFIGURATION**

The “**Location**” option supports cases where a User has a need to physically move their system from one facility (location) to another on a regular basis. This function addresses cases where this movement includes connecting to a unique network at each location, for sending to DICOM devices, and those network connections consist of different IP addresses and/or target DICOM devices.

The “Location” feature allows for simultaneously having multiple configurations saved on the system, and the ability to quickly toggle between those settings by merely changing “Locations” in the menu. The parameters that are saved as a unique “Location” using this feature are as listed below:

- **System Setup->Display->Institution** page settings (Hospital Name)
- **System Setup->Archive->Network** page settings (IP Address, Gateway, Netmask)
- **System Setup->Archive->DICOM->General** page settings (AE Title, etc)
- **System Setup->Archive->DICOM->Worklist** page settings (*Enabled* server selection)
- **System Setup->Archive->Store/Print** page settings for devices using Print/Store buttons
- **System Setup->Archive->Serial Port** page settings (Calc report data via USB port)

1. To setup a new “Location”, first go to the setup pages listed above, and configure all of the settings (IP Addresses, AE Titles, etc) applicable to the new site location.
2. Once all the Network/DICOM/Store-Print settings have been entered in these other menus, perform the following steps to capture those settings as a new “Location”.

-
3. Use the Setup button and trackball to advance menu screen to select **TOOLS** menu

TOOLS Menu



4. Using the trackball and scroll down to backlight **SYSTEM SETUP** selection, and press one of the **SET** keys  to bring up the main menu, then select the **ARCHIVE** option, followed by the **LOCATION** option.

SYSTEM SETUP Sub-Menu



ARCHIVE Sub-Menu

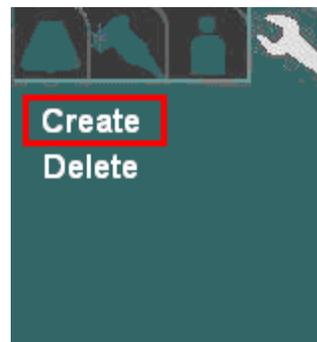


5. Within the **Location** selection, use the Menu Control to backlight **Manage** selection, and press one of the **SET** keys  to bring up this menu.

LOCATION Sub-Menu

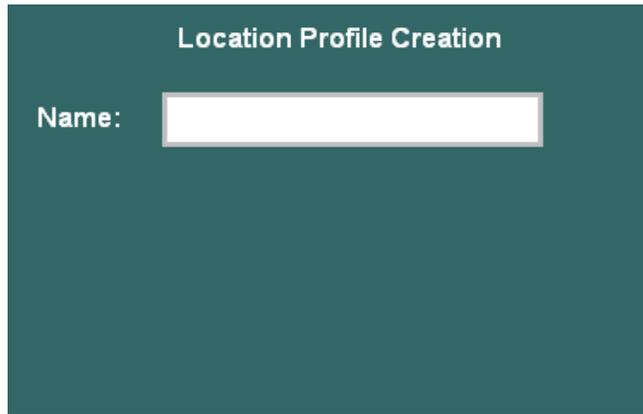


MANAGE Sub-Menu



6. Using the **Menu Control**, arrow down to backlight **CREATE** selection, and press one of the **SET** keys  to bring up the location creation page.

CREATE Sub-Menu



7. Enter in the desired user-defined name to be used for the new “Location”
8. To save the new Location, select **APPLY** from the main menu, and press one of the **SET** keys . Open each of the configuration pages (Network, DICOM General, etc) for parameters that are savable under the Location manager, and enter in the desired settings. .

➤ **DICOM” GENERAL” CONFIGURATION**

1. Use the Setup button and trackball to advance menu screen to select **TOOLS** menu.

TOOLS Menu



2. Using the trackball and scroll down to backlight **SYSTEM SETUP** selection, and press one of the **SET** keys  to bring up the main menu, then select the **ARCHIVE** option, followed by the **DICOM** option.

SYSTEM SETUP Sub-Menu



DICOM Sub-Menu



3. Within the **DICOM** selection, use the Menu Control to backlight **GENERAL** selection, and press the SELECT button  to bring up this menu.

DICOM Sub-Menu



DICOM GENERAL Sub-Menu

Field	Value
DICOM Application Title:	ZONARE
Station Name:	ZONARE
TCP Timeout:	30 seconds
Queue Timeout:	120 seconds
Queue Start Type:	Automatic
Keep Alive Timeout:	3600 seconds
Association Acceptor:	<input checked="" type="checkbox"/> Port: 104 <input type="checkbox"/> Storage
Log Level:	Normal
Structured Reports:	<input checked="" type="checkbox"/> Enable Debug

4. Using the alpha-numeric keyboard, enter in the required **DICOM** configuration values/settings in the appropriate fields, as specified in the information previously provided in the “**Pre-Installation Site Survey Form**”, by the medical facility’s IT System Administrator.
5. To save the new settings, select **APPLY** from the main menu, and press the SET key  to save new settings.

➤ **DICOM “PRINTERS” CONFIGURATION**

1. Within the **DICOM** selection, use the Menu Control to backlight **PRINTERS** selection, and press one of the **SET** keys   to bring up the **DICOM Printer Administration** menu.

DICOM Sub-Menu

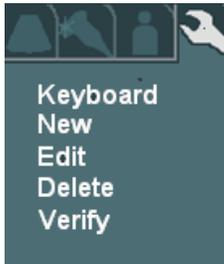


PRINTER Administration Sub-Menu

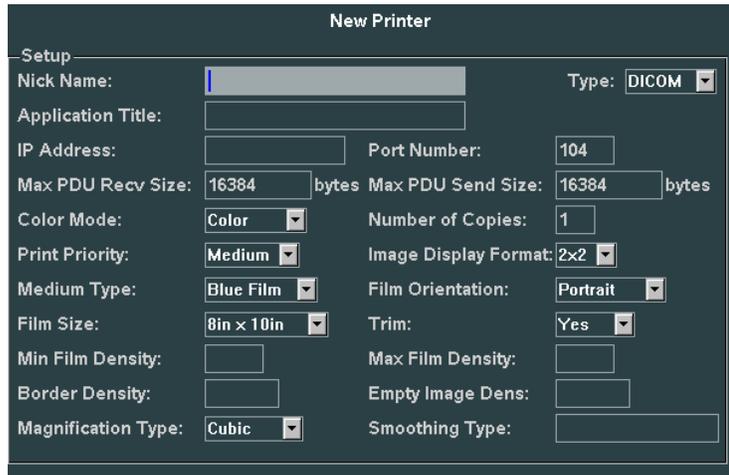


2. To create an entry for a new printer to be added to the DICOM connectivity for the z.one_{pro}, use the Menu Control to backlight **NEW** from the main menu, and press one of the **SET** keys   to bring up the **DICOM Printer Administration** menu.

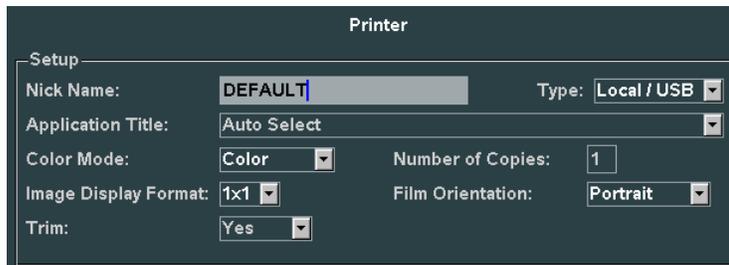
DICOM Sub-Menu



PRINTER New/Edit Sub-Menu



DICOM Network Printer Setup Page



Local USB Printer Setup Page

- Using the alpha-numeric keyboard, enter in the DICOM configuration values/setting in the appropriate fields, as specified in the information previously provided in the “**Pre-Installation Site Survey Form**”, by the medical facility’s IT System Administrator.
- To save the new settings, select **APPLY** from the main menu, and press one of the **SET** keys  to save new settings.

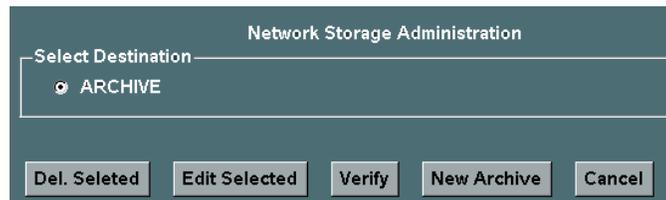
➤ **DICOM” NETWORK STORE” CONFIGURATION**

- Within the **DICOM** selection, use the Menu Control to backlight **Network Store** selection, press one of the **SET** keys  to bring up this menu.

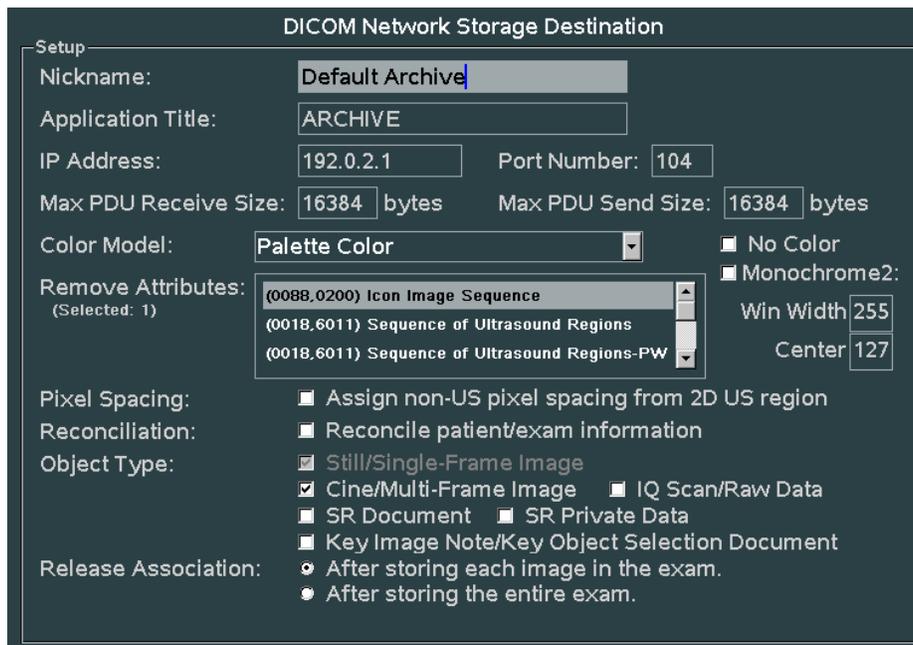
DICOM Sub-Menu



DICOM NETWORK STORE Sub-Menu



- To add a new network store archive, select **NEW** from the main menu, to bring up the following menu.



- Using the alpha-numeric keyboard, enter in the DICOM configuration values/setting in the appropriate fields, as specified in the information previously provided in the “**Pre-Installation Site Survey Form**”, by the medical facility’s IT System Administrator.

4. To save the new settings, select **APPLY** from the main menu, and press one of the **SET** keys  to save new settings.

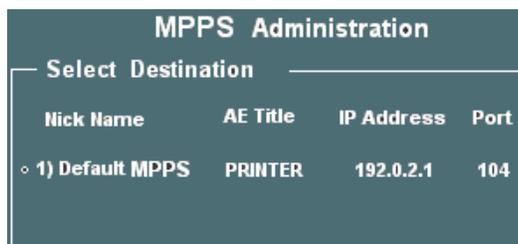
➤ **DICOM” MPPS” (MODALITY PERFORMED PROCEDURE STEP) CONFIGURATION**

1. Within the **DICOM** selection, use the Menu Control to backlight **MPPS (Modality Performed Procedure Step)** selection, press **Select** button to bring up this menu.

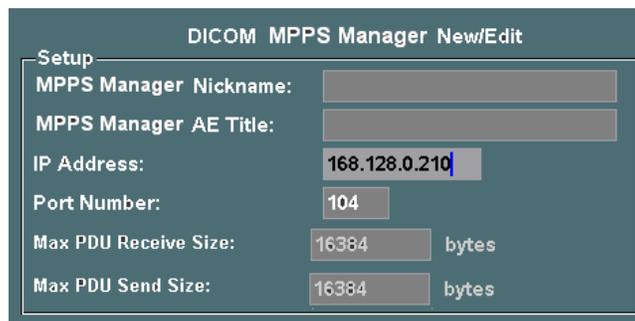
DICOM Sub-Menu



DICOM MPPS Sub-Menu



2. To add a new MPPS destination, select the **NEW** from the main menu, to bring up the following sub-menu.



3. Using the alpha-numeric keyboard, enter in the DICOM configuration values/setting in the appropriate fields, as specified in the information previously provided in the “**Pre-Installation Site Survey Form**”, by the medical facility’s IT System Administrator.

4. To save the new settings, select **APPLY** from the main menu, and press one of the **SET** keys  to save new settings.

➤ DICOM" WORKLIST" CONFIGURATION

1. Within the **DICOM** selection, use the Menu Control to backlight **Worklist** selection, press Select button to bring up this menu.

DICOM Sub-Menu



DICOM WORKLIST CONFIG Sub-Menu

A screenshot of the "DICOM Modality Worklist Server" configuration screen. The screen has a dark grey background with white text. At the top, it says "DICOM Modality Worklist Server". Below this, there is a "Setup" section with several fields and controls:

- Nick Name: [text input field]
- Application Title: [text input field]
- IP Address: [text input field]
- Port Number: [text input field with value 104]
- Max PDU Recv Size: [text input field with value 16384] bytes
- Max PDU Send Size: [text input field with value 16384] bytes
- Scheduled Start Date: [dropdown menu with value Today]
- Scheduled Modality: [dropdown menu with value US - Ultrasound, (Selected: 1)]
 - XA - X-Ray Angiography
 - XC - External-Camera Photography
- Scheduled Station AE Title: [text input field]
- Automatic Query Type: [dropdown menu with value Every 5 minutes] [checkbox] Query on Display
- Maximum Entries Cached: [text input field with value 200] [checkbox] Filter Cached Entries [button] Clear Cache

2. Using the alpha-numeric keyboard, enter in the DICOM worklist values/setting in the appropriate fields, as specified in the information previously provided in the "**Pre-Installation Site Survey Form**", by the medical facility's IT System Administrator.

3. To save the new settings, select **APPLY** from the main menu, and press one of the **SET** keys  to save new settings.

“Network” Setup

The “NETWORK” configuration menu allows for configuring the TCP/IP networking parameters that will be assigned to define the identity of the system on the hospital’s network.

1. Use the Setup button and trackball to advance menu screen to select **TOOLS** menu, then select **SYSTEM SETUP**.

SYSTEM SETUP Menu



NETWORK Menu



Using the trackball scroll down to backlight **ARCHIVE** selection, and press one of the **SET** keys  to bring up this menu.

Using the trackball scroll down to backlight **NETWORK** selection, and press one of the **SET** keys  to bring up this menu.

NETWORK Sub-Menu

Network Configuration

TCP/IP

IP Address:

- Obtain Automatically (use DHCP) (Current IP: 0.0.0.0)
- Use Specified:

Gateway IP Address: Subnet Mask:

Ethernet

Media Type: MTU:

Wireless Bridge

Module Firmware Version: Not available

Radio Firmware Version: Not available

User Name: dpac

IP Address (Device): 192.168.2.1

Wireless Status

Status: Wireless radio is on.

Start Radio on Power Up

Using the alpha-numeric keyboard, enter in the required TCP/IP network configuration values/settings in the appropriate fields, as specified in the information previously provided in the “**Pre-Installation Site Survey Form**”, by the medical facility’s IT System Administrator.

Using the **Menu Control**, arrow down to backlight **Apply** selection in the main menu, and press one of the **SET** keys  to save the serial port configuration setup, and exit.

9.1.1 “WIRELESS NETWORK” EQUIPMENT - SETUP

ZONARE supports wireless connectivity using the **Quatech** (*brand*) **AirborneDirect** (*model*) Wireless Ethernet Bridge (supported model is the ABDG-ET-DP501, or currently obsolete model ABDG-ET-DP101). This is a plug-and-play wireless networking solution that is compatible with all ZONARE ultrasound systems that support Ethernet connectivity. A special power cable, however, is required to supply power to the **Quatech AirborneDirect** device from a USB port on the ZONARE system, for portable operations.

The **Quatech AirborneDirect** Wireless Ethernet Bridge supports WiFi 802.11b/g wireless standards and connects to the ZONARE system through a 10 Base-T network interface. This device supports WEP (64/128 bit) and WPA encryption standards, and LEAP for network authentication (LEAP required the Quatech device to be configured with a static 128 bit key; this is known as "migration mode" and is not recommended for longterm use due to the static WEP key requirement). Before using it with the ZONARE system, the **Quatech AirborneDirect** device must be preconfigured for the user's networking environment – SSID, channel, encryption, and correct addressing scheme (DHCP/static).

Static IP addressing is required in order to be able to display the additional wireless status. When power is applied to a correctly configured **Quatech AirborneDirect** device that is connected to the Ethernet port on the ZONARE system, it will require 30 to 60 seconds to detect and then associate with the user's wireless network. Once a wireless network connection is established, the ZONARE system will reflect the connection state by showing the network ICON on screen, in an uncrossed state.

The configuration of the **Wireless Bridge** is done on the **Network** configuration screen. The source information required for wireless device configuration on the **z.one_{pro}**, is the static **IP Address** assigned (by the IT Administrator at the install site) to the **Quatech AirborneDirect** device and the **Username** and **Password** for the CLI interface (default is **dpac** for both).

For assistance with the configuration of the local network settings on the **z.one_{pro}**, to support that aspect of a wireless network installation, contact Mindray Technical Support.

“FTP” Setup

The “**FTP**” configuration menu allows for configuring the IP address and Nickname settings for direct network attached transfer (**STORE**) operations from the **z.one_{pro}** to remote storage on an FTP server, using the FTP protocol.

1. Use the Setup button and trackball to advance menu screen to select **TOOLS** menu, then select **SYSTEM SETUP**.

SYSTEM SETUP Menu

ARCHIVE Menu



Using the trackball scroll down to backlight **ARCHIVE** selection, and press one of the **SET** keys   to bring up this menu.

Using the trackball scroll down to backlight **FTP** selection, and press one of the **SET** keys   to bring up this menu.

Using the trackball scroll down to backlight **FTP Store** selection, and press one of the **SET** keys   to bring up this menu **FTP Store** Sub-Menu



Using the alpha-numeric keyboard, enter in the required FTP configuration values/settings in the appropriate fields, as specified in the information previously provided in the “**Pre-Installation Site Survey Form**”, by the medical facility’s IT System Administrator.

FTP Storage Destination

Setup

External media image format: DICOM Non-DICOM

Nickname:

IP Address: Port Number:

User Name: Password: Confirm:

Data Transfer Mode Active Passive

Close Connection: After storing each image. After storing the entire exam.

Remove embedded icon/thumbnail image

DICOM Export Options

Compression Type Quality

Color Model Monochrome2:

Remove Attributes: Win Width:
 [Selected: None] Center:

Non-DICOM Store Options

Still image file format JPEG TIFF

Include patient name in export folder name

Using the trackball scroll down to backlight **Apply** selection in the main menu, and press one of the **SET** keys   to save the serial port configuration setup, and exit.

“Security” Setup Menus



Warning *If the security password is lost or forgotten, there is **NO** master password available to recover system access.*

To restore use of the system, it will be necessary to perform a complete re-installation of system software. Refer to the “Advanced” Software Installation Procedure information in this manual.

1. Use the Setup button and trackball advance menu screen to select **TOOLS** menu.

TOOLS Menu



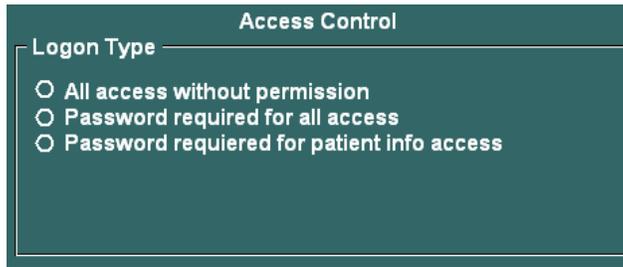
Using the trackball scroll down to backlight **SECURITY** selection, and press one of the **SET** keys  to bring up this menu.

SECURITY Sub-Menu



Select the desired level of security control, by clicking on the bullet to the left of the desired offering in the menu.

ACCESS CONTROL Sub-Menu



Under the Logon Password field, enter in the desired security access password. (NOTE: You will need to enter it in a second time in the “CONFIRM” field, to ensure accuracy).



To save the new Security settings, select **Apply** on the main menu, and exit.

“Power Save” Setup Menu

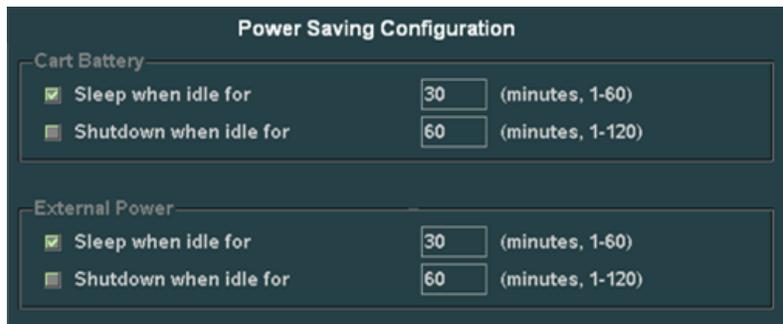
➤ CONFIGURING “POWER SAVE” CONFIGURATION

1. Within the **System Setup** screen, use the Menu Control to backlight **Power Save** selection, press one of the **SET** keys  to bring up this menu.

SYSTEM SETUP Sub-Menu



POWER SAVE Sub-Menu



The three different categories of power operation mode configurations in this menu are:

<u>Title</u>	<u>Definition</u>
<i>Cart Battery</i>	Configuration of power saving action when the system is being operated without AC power applied. System will be

	running off the z.one _{pro} 's internal Z-PAK battery.
External Power	Configuration of power saving action when the system is running off AC wall power

The two configurable Power Save behaviors offered are:

<u>Title</u>	<u>Function</u>
Sleep when idle	Screen display is “Blanked”, after configured time period has elapsed
Shutdown	System performs a complete sequenced “Power-Down” operation, after configured time period has elapsed

- For each of the power configurations, select the desired power saving option, and enter the desired time interval, from the menu.

NOTE: *Unchecking the “Enabled” box, for either option, disables that time-out function*

- Place the arrow cursor over the **APPLY** soft-button displayed in this menu, and press one of the **SET**

keys  to save new settings.

11 FUNCTIONAL DESCRIPTIONS

System Capabilities

- 64-hardware - 128/192-synthetic channel system
- Supports B-Mode, M-Mode, Color, Power Doppler, PW
- 17" full-screen, 1280 x 1024 resolution, Display
- Full-sized alpha-numeric user keyboard
- Discrete function user controls
- Software mode assignable user controls
- User programmable keys
- Integrated stereo speakers (located in display)
- External I/O device connectivity
 - Ethernet 10/100Base-T
 - eSata/USB Connector
 - USB port
 - HDMI Connector
- Internal solid-state drive (image archive)
- Internal CD/DVD Multi-Recorder
- On-board Z-Pack Battery Module (Option)

Major FRUs

11.1.1 POWER MODULE ASSY, Z.ONE_{pro} P/N: 88012-00

- VCart (power for module), +12V
- VDock (Monitor, UI, DVD, Printer), +12V
- Z-PAK battery charging circuitry
- Z-PAK battery fuel gauge
- PIC Power Supply Controller logic
- External system status LEDs (7)



11.1.2 USER INTERFACE ASSY, Z.ONE_{pro}

P/N: 86700-00 (86702-00 FOR SP VERSION)

- QWERTY keyboard
- OLED soft-function displays
- Trackball assembly
- DGC controls
- Discrete functional controls



11.1.3 DISPLAY, Z.ONE_{pro}

P/N: 89051-00

- System display
- Speakers



11.1.4 ELECTRO AND MECHANICAL ASSEMBLIES

11.1.5 BRAKE MECHANISM - WHEEL

The system has 2 different types of casters. The front right caster (green tab) is used as a directional/swivel lock. The other 3 casters have break features. Using the bottom of your shoe to push down, press the lower tab to engage, and the upper tab to release.

- With all 4 casters “unlocked” all casters will be in full swivel mode.
- By locking the front right (green) caster, the system will be in a directional mode.
- Any combination of the other 3 casters can be used to lock the system from moving.

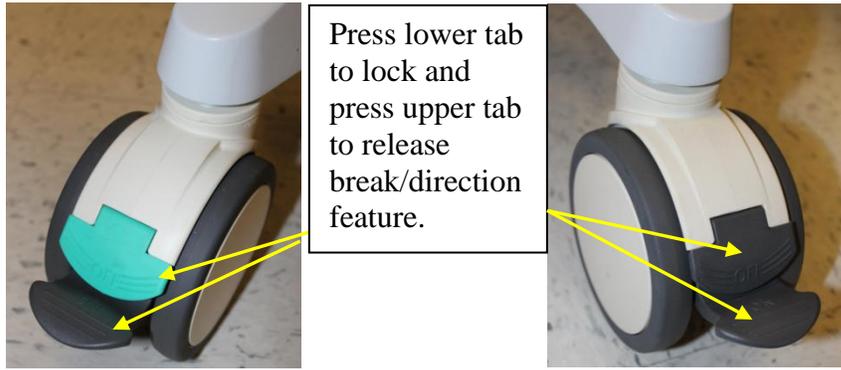


Figure 6.1: Directional/swivel Caster Figure 7.2: (X3) Breaking Caster

11.1.6 HEIGHT ADJUSTMENT MECHANISM

The system utilizes a gas spring mechanism that enables the user to optimize the vertical position (height) of the user interface panel and LCD Display for optimum comfort and viewing during operation.

To raise or lower the unit, pull inward on the release lever, located on the inside of the right-front handle assembly on the system. This will allow the height of the system to be adjusted. Releasing the spring-loaded release lever locks the assembly into the current vertical position.



Figure 8: Height Adjustment Mechanism

BEGINS ON NEXT PAGE

Power Block Diagram

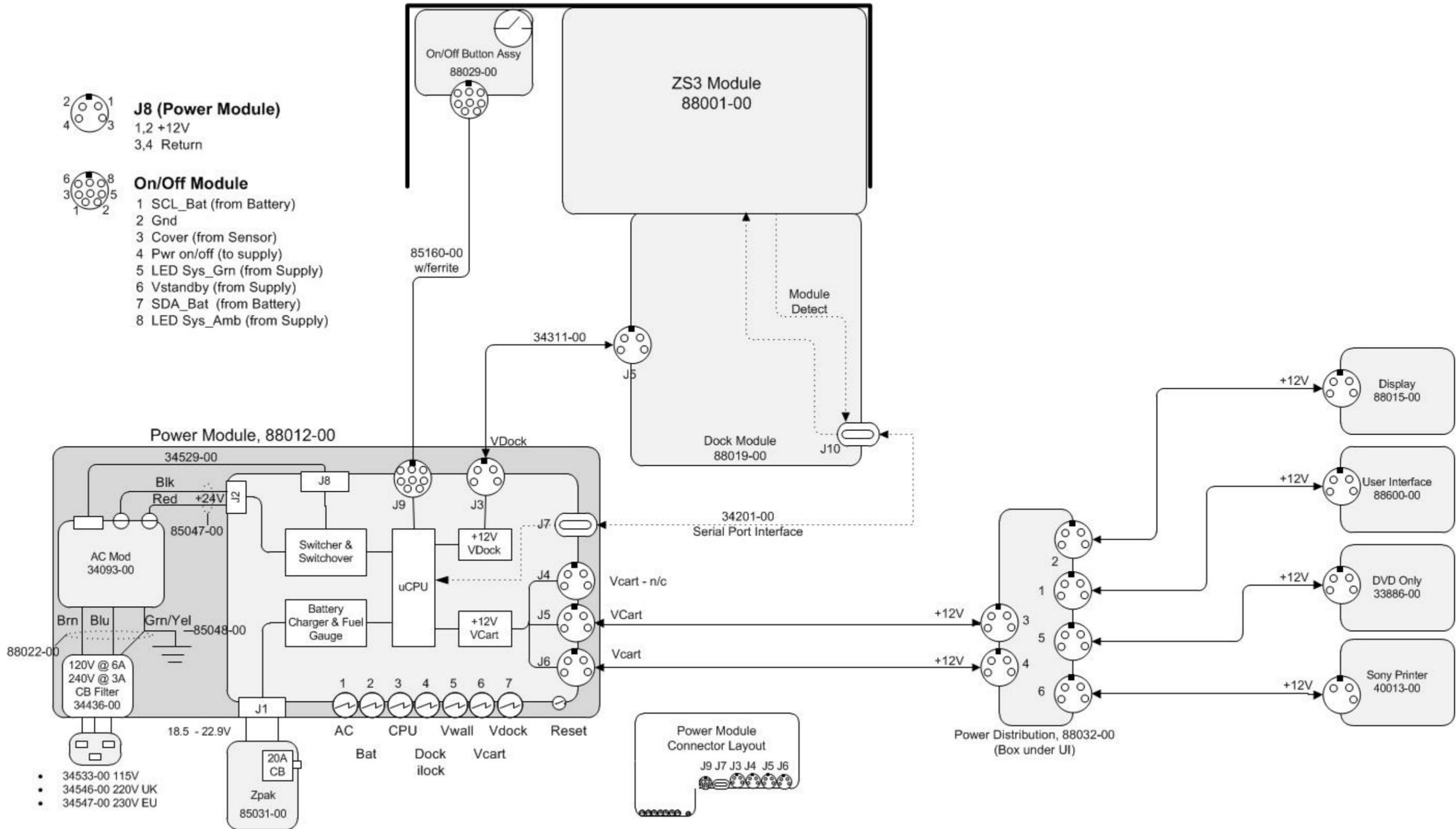


Figure 21: Power Block Diagram

Cabling Diagram

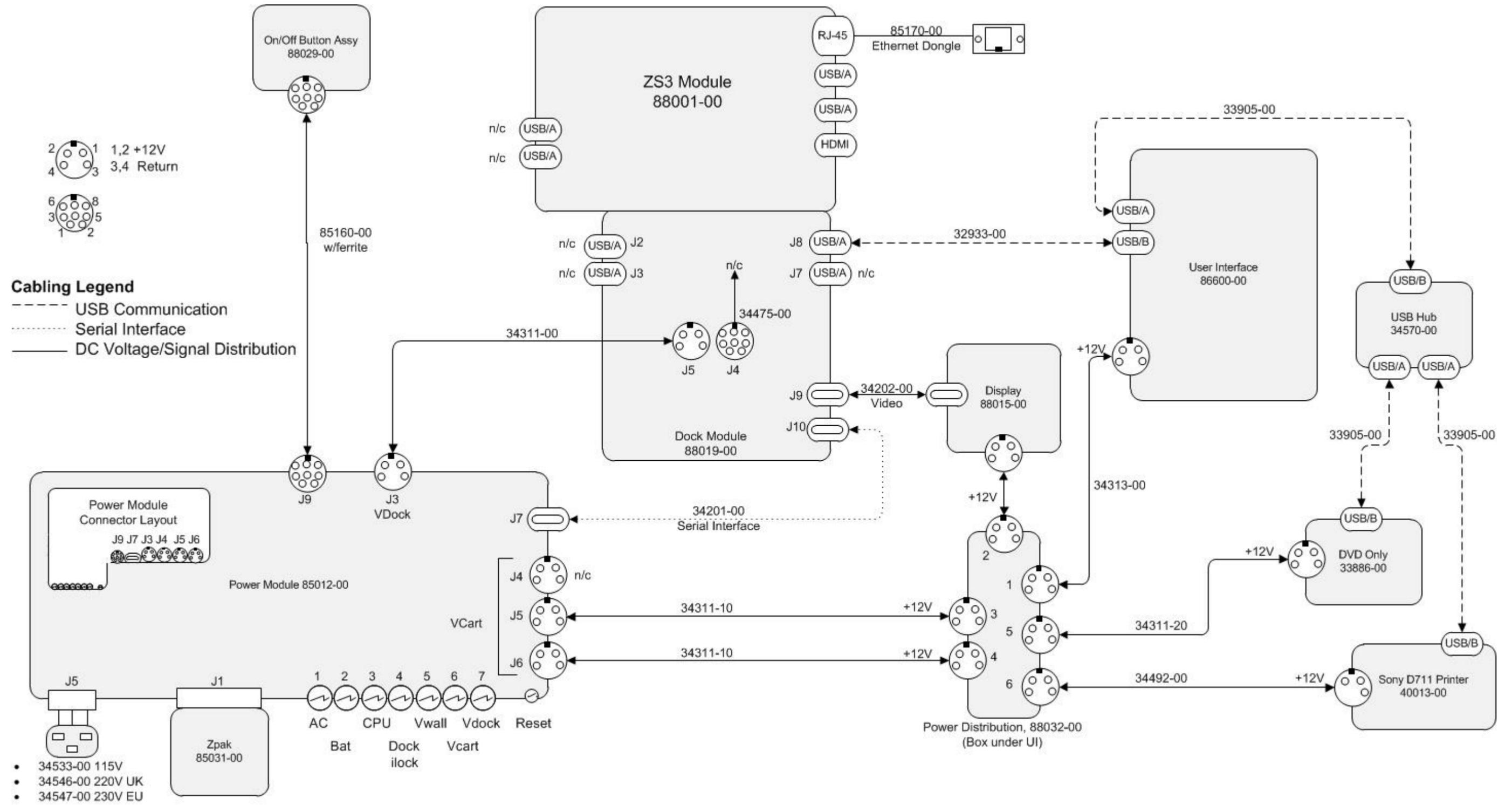


Figure 22: Cabling Diagram

System Block Diagram

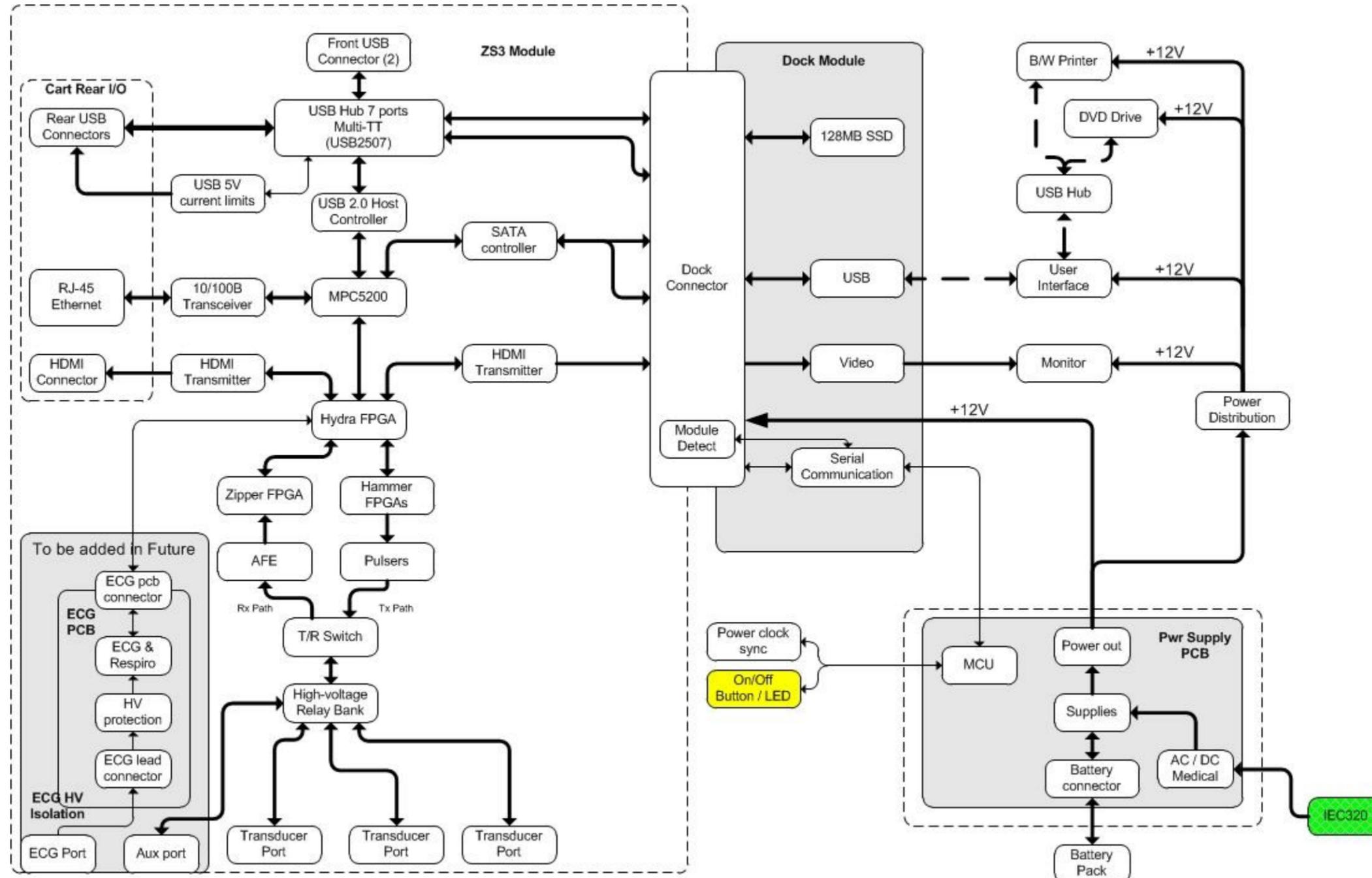


Figure 23: Overall System Block Diagram

13 PERIPHERALS & ACCESSORIES

CD/DVD Drive

The system includes an internal **CD/DVD** burner that is used for exporting of ultrasound images. The port for accessing the CD/DVD drive for insertion/removal of media is located just under the user interface assembly.



13.1.1 MEDIA TYPES

Wide variability in CD and DVD quality can prevent the system from reliably writing to and reading from some commercially available discs. ZONARE has tested the CD and DVD products in [Figure 13](#) and currently recommends their use. For up-to-date CD/DVD recommendations, go to www.zonare.com/support/accessories/media/.

Manufacturer	Part No.	Media	Capacity	Speed
CD-R				
Maxell	648200	100 Pack Spindle	700 MB	48X (max.)
DVD+R				
Taiyo Yuden	DVD+ZZ100SB16	YUDEN000T03	4.7 GB	16X (max.)

Figure 9: CD/DVD Part Numbers

IMPORTANT



For use of DVD media type for Exports, only one brand of DVD media has been tested and approved to be compatible for use with the ZONARE system. The approved DVD media type is Taiyo Yuden brand.

Before deleting any exam data from the system, always verify that the data was successfully transferred to the CD/DVD by viewing it on an external reader/player.

When exams are exported onto the CD/DVD, a DICOM viewer program (Showcase) is simultaneously exported onto the CD/DVD, allowing the exams to be opened, annotated, and saved in several formats on most PCs.

SPECIAL NOTE

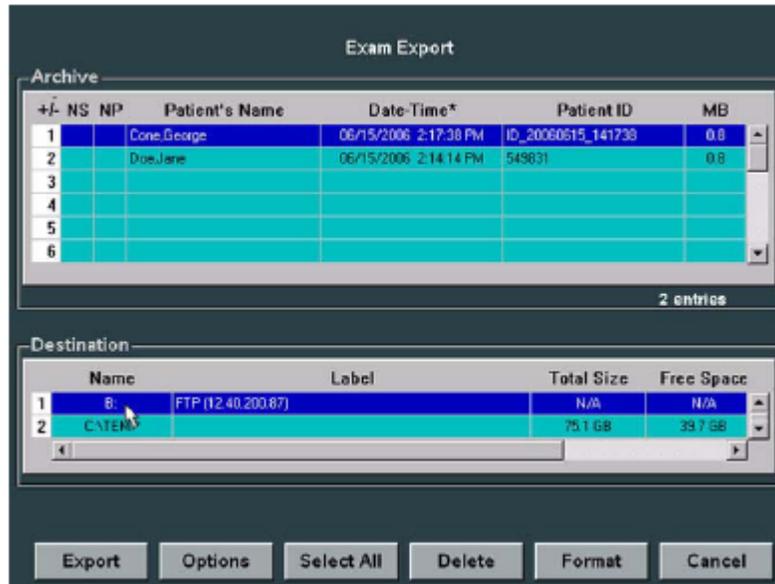


If an incompatible type of DVD/CD media is accidentally inserted into the system drive, it will not be recognized by the system, and hence the “EJECT” function in the ARCHIVE menu will not be active (it will be “grayed-out”).

In order to eject this type of incompatible media, it will be necessary to perform a manual override “EJECT”. This is accomplished by holding down the “RECORD” button  on the user interface panel of the z.one_{pro}, until the DVD/CD is ejected.

13.1.2 OPERATION

The exporting/importing of exam data (images) to/from the **DVD/CD** burner on the z.one_{pro} is performed in the **ARCHIVE** review menu (pressing the **ARCHIVE** key). The **DVD/CD** burner is then selected as the target device; the desired exam(s) is highlighted in the Archive menu, and the “**EXPORT**” or “**IMPORT**” softkey function selected to copy the images.



Black & White Printer

The procedure provides instructions to install and setup the SONY UP-D711 Black and White printer on the z.one_{pro} system



Prior to beginning the initial mounting/installation, ensure the system is powered-down (Backlight for On/Off button will be dark.).

13.1.3 UNPACKING AND MOUNTING INSTRUCTIONS

1. Remove the printer and all installation hardware from their packaging.
2. Drop telescoping cover to find preinstalled printer power and USB cables. Cut cable-tie to release their free ends and route them forward with the already installed DVD cables. Replace telescoping cover.



3. Use a Philips screwdriver to install the four (4) 33104-00 screws that attach the printer/bracket assembly to the user interface base. Threaded holes are in the UI casting on each side of the DVD assembly (as shown below).



Figure 10: Printer Bracket Mounting to z.one_{pro} Cart

4. NOTE: The printer comes out of the box with M3 Phillips head screws installed in its threaded mounting holes, as placeholders or thread protectors. These screws need to be removed before sliding the printer into the bracket. Place printer into bracket and slide back toward cart column to expose power and USB connections on right side. Connect USB cable to printer. Connect power cable to printer.

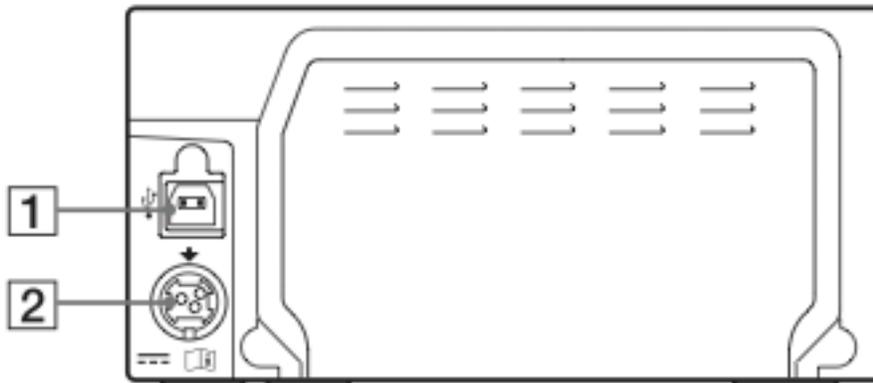


Figure 11: Cable Connections (UP-D711)

- Slide printer forward to its mounting position in the bracket. (Mounting holes in bracket will align with threaded holes in bottom of printer – in centers of round pads. Top front printer corners will be approximately in alignment with the lower front surface of the DVD cover, as shown below).



- Using a Philips screwdriver, install the four (4) 33215-00 flat head screws (provided in the kit), through the holes in the mounting bracket and into the four threaded holes in the printer, as shown below.



7. Dress printer cables up inside the printer bracket and secure with the cable-tie (30133), as shown below



13.1.4 OPERATOR CONTROLS

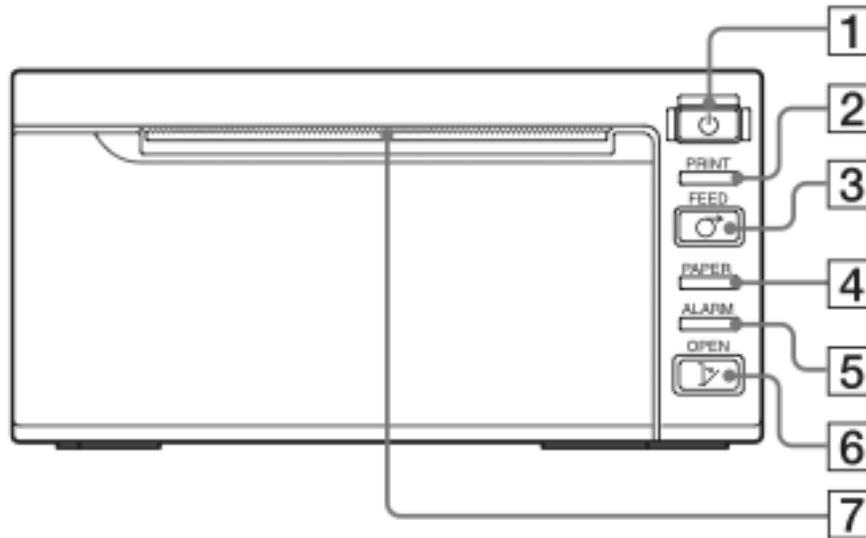
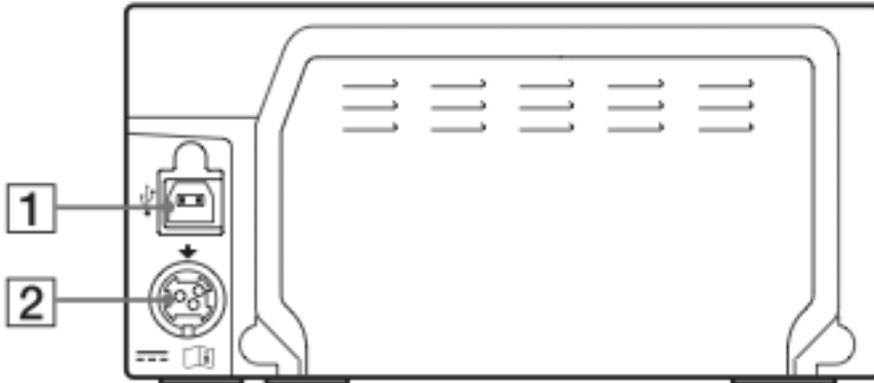


Figure 12: Operator Controls (UP-D711)

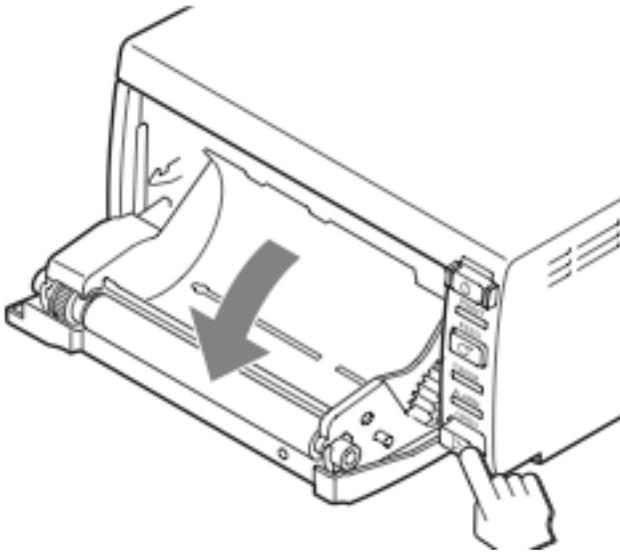
1. Power ON/OFF Switch
2. Printer Lamp – Lights while printing
3. Feed Button – Hold down to feed paper. The paper will only advance while the button is pressed.
4. Paper Lamp – Lights when tray is empty or paper not aligned correctly.
5. Alarm Lamp – Lights when door is open or problem with printer.
6. Open Button – Press to open door or press and hold to open all the way.
7. CUT - cuts paper after image is printed.

13.1.5 SETUP PROCEDURE

1. Connect the USB cable with the  (USB) symbol facing up into the back of the printer.
2. Connect the DC power cable in to the back of the printer.

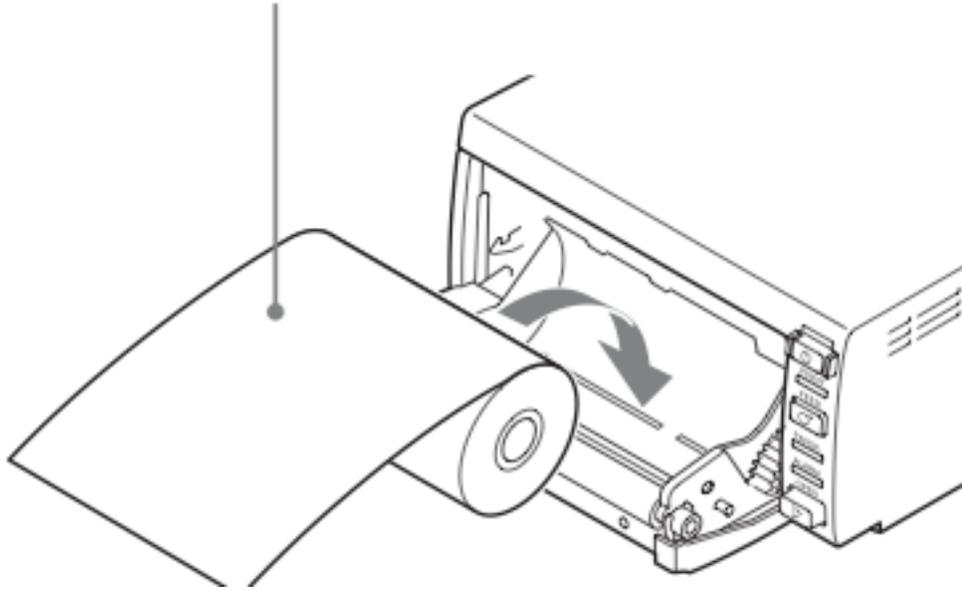


3. Power-On the system.
4. Turn the printer on by pressing the  button.
5. Press and hold the Open button to extend the paper tray.

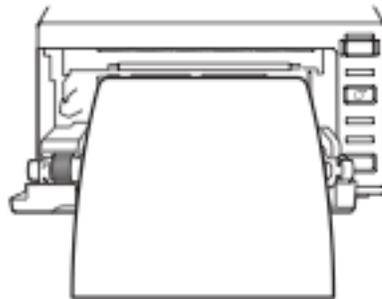


6. Place the paper roll into the tray and make sure the paper extends out through the opening.

Load the paper with the printing side (heat sensitive side) up. Printing is not possible if the paper is reversed.



7. Make sure the paper is set straight.



9. Close the door and press until it locks.

13.1.6 SETUP PROCEDURE

1. Access the **New Printer** menu, using the path
System Setup->Archive->DICOM->Printers->New

New Printer

Setup

Nick Name: Default Printer | Type: DICOM (dropdown menu open showing DICOM and USB)

Application Title: PRINTER

IP Address: 192.0.2.1 | Port Number: 104

Max PDU Recv Size: 16384 bytes | Max PDU Send Size: 16384 bytes

Color Mode: Color | Number of Copies: 1

Print Priority: Medium | Image Display Format: 2x2

Medium Type: Blue Film | Film Orientation: Portrait

Film Size: 8in x 10in | Trim: Yes

Min Film Density: | Max Film Density: |

Border Density: | Empty Image Dens: |

Magnification Type: Cubic | Smoothing Type: |

- Using the pull-down menu, under the “TYPE” selection, select the **USB** printer. The menu will change to the limited setup page for a USB style printer (as shown below)

Printer

Setup

Nick Name: PRINTER NAME HERE | Type: Local / USB

Application Title: Auto Select

Color Mode: B/W | Number of Copies: 1

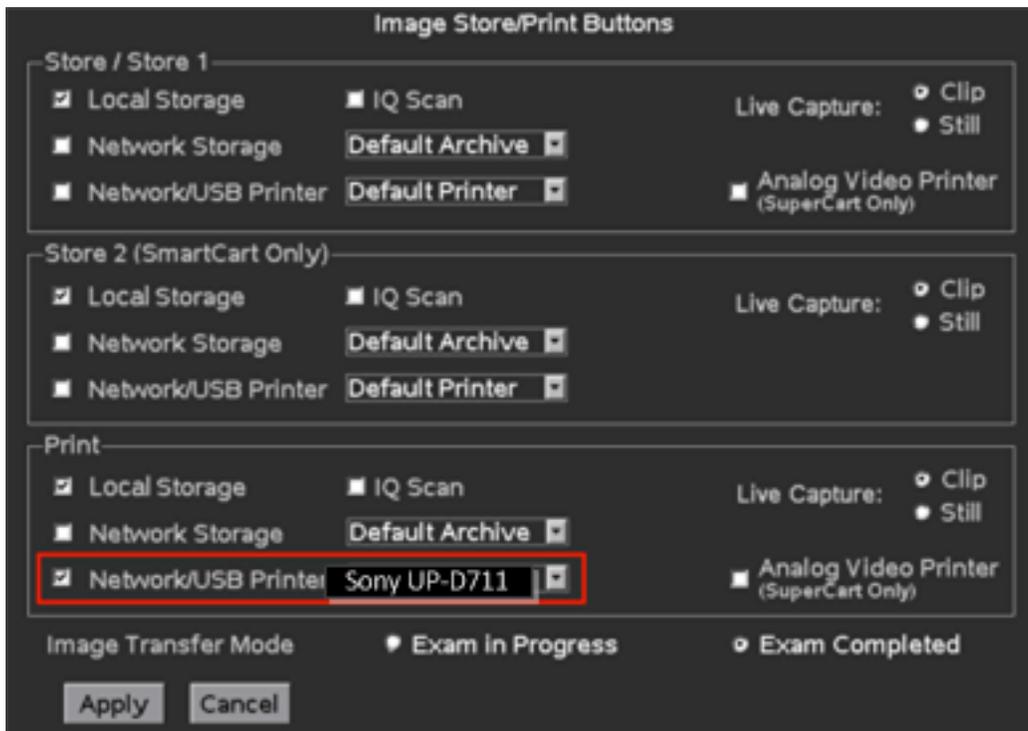
Image Display Format: 1x1 | Film Orientation: Portrait

Trim: Yes

- Type into the “Nick Name” field, the name of the printer: “SONY UP-D711”
- Set other print parameters as desired.
- Select “APPLY” from the main menu, to save the changed settings

13.1.7 PRINT BUTTON CONFIGURATION (TRIGGER):

- Access the Print/Store Button configuration screen, using the path
System Setup->Archive-> Store/Print



2. Under the “**Network/USB Printer**” function for the “**Print**” button, check the box to the left of the drop-down menu, enable this function
3. In the drop-down menu for this function, select the “**SONY UP-D711**” selection
4. Select “**APPLY**” from the main menu, to save the changed settings

13.1.8 PRINT VERIFICATION:

1. Power on the *system*, the printer, and connect a transducer.
2. **FREEZE** the image. Verify a printed image is produced when the “**Print**”  key is depressed.

NOTE: Refer to the *SONY UP-D711 Operators Manual*, for detailed information on proper operation of this device.

13.1.9 INSTALLATION NOTES:



SPECIAL NOTE



The Sony UP-D25MD Color Printer is oversize and is therefore not a peripheral that can be “mounted” on z.one_{pro} system. A separate external location (rolling cart, tabletop, etc) must be made available for storage of this printer.

The system software on the z.one_{pro} system contains the necessary drivers to support operation and printing to the Sony UP-D23MD and UP-D25MD Color Printers.

The information provided below covers the basic menu setup, to enable printing to this device.

13.1.10 SETUP PROCEDURE:

1. Identify the dedicated work area, within reach of the system, for placement of the Sony UP-D25MD printer and setup the printer in that location.
2. Power off the system.
3. Attach the USB cable between the Sony UP-D25MD Color Printer and one of the USB ports on the rear of the system
4. Connect the AC power cable to the rear panel power plug of the UP-D25MD labeled “AC IN.”
5. Apply power to the system and printer.
6. Under the **SETUP ARCHIVE -> DICOM -> PRINTERS** page, create a new “**Local/USB**” type printer entry for the Sony UP-25MD printer
7. Enter in “**Sony UP-D25MD**” to the *Nick Name* field of the printer configuration page
8. Enter in the desired printer settings, from those offered in the on-screen menu, and then select “**APPLY**” to save.
9. Under the **ARCHIVE -> STORE/PRINT** page, configure the “**Print**”  button for triggering a print to the Sony UP-25MD printer.
3. Connect a transducer to the system. Wait for startup to complete and image to be shown.
4. Press the “**FREEZE**” key to capture an ultrasound image.
5. Verify a printed image is produced on the UP-D25MD when the “**Print**”  key on the user interface is depressed.

NOTE: *Refer to the SONY UP-D25MD Installation Procedure (P/N S00119), or Operator Manual from SONY, for detailed information on proper operation of this device.*

Network Report Printer

13.1.11 PROCEDURE NOTES:



The intent of this procedure is to provide instructions, for use in the field, for setup and use of a Post Script-3, **PS3** (or above) style, HP LaserJet Network Printer, for OB, Vascular, or Cardiac **Report** printing, on the system.

NOTE: *The following key limitations regarding the use of the HP LaserJet Color Printer on the z.one_{pro} product should be noted.*

- *The HP LaserJet color printer is ONLY used for reporting of OB/GYN report pages (NO ultrasound image printing).*
- *The HP LaserJet printer is NOT a device that is mountable z.one_{pro} system. It will require a remote cart or remote shelf for use.*



z.one_{pro} Cable Connection

- **Initial Setup – Network Connection Method:**

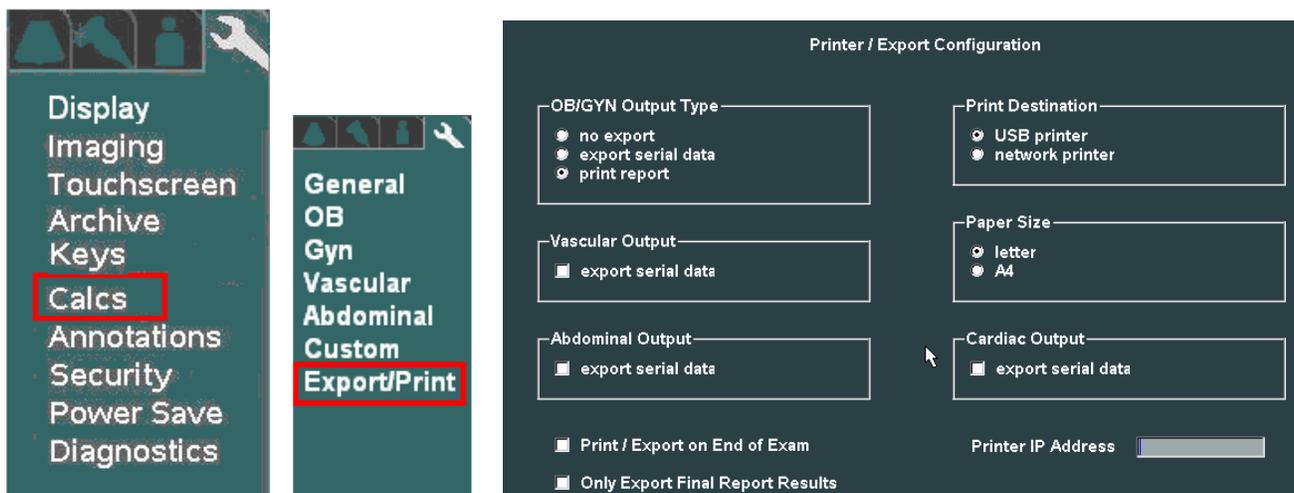
1. Connect the AC power cord to the printer, and the other end to an active AC Power outlet

2. Connect one end of the network crossover cable to the HP LaserJet printer, and the other end to the Ethernet (RJ-45) port on the system.
3. Power on the HP LaserJet printer
4. Open the paper tray on the printer, and install the desired paper.
5. Power on the system

• **Report Printing Configuration – on z.one_{pro} system**

In order to utilize this Report printing capability, it is necessary to pre-configure the Export/Print setup parameters, within the “CALCS” sub-menu, as part of the System Setup operations. The following steps and menus are used for the setup of this Report Exporting/Printing function.

1. Go to the Printer/Export configuration screen, by selecting the following sequence:
System Setup -> Calc -> Export/Print



Printer/Export Configuration (Calc Reporting)

2. To configure the system for printing of the desired type (OB, Vascular) reports to the HP LaserJet, select the following:
 - OB/GYN Output Type:..... **PRINT REPORT**
 - Printer Destination: **NETWORK PRINTER**
 - Paper Size: **LETTER**
 - Printer IP Address: Enter printer’s assigned IP (potentially 192.168.1.1)
 - Print/Export on End of Exam: (as desired by User)
 - Only Export Final Report Results: (as desired by User)
 - Select “APPLY” in the menu, to save the settings

NETWORK Installations Only:

To meet regulatory requirements for user safety, Ethernet “Network” connectivity is the only method recommended for attaching the HP LaserJet printer to the system.

In this configuration a direct cable connection will be used between the printer and the z.one_{pro} (using a “crossover cable”). The generic IP Address setup in the printer will need to be entered into the corresponding report printer configuration page on the system.

To find out the IP Address currently setup as a factory default in the HP LaserJet printer, perform the following steps:

1. With the printer powered ON, the z.one_{pro} powered ON, and the crossover cable connected between the two devices, perform the following step.
2. On the HP printer, press and **hold** (for 5 seconds), the “**GO**” button
3. A series of pages of internal configuration information about the printer should print out.
4. Check the **IP Address** value that appears on the Networking Info page
5. Enter this value into the **PRINTER IP ADDRESS** field, on the Export/Report Configuration page

***NOTE:** For configurations where printer is being attached to an existing DICOM network that is running on the system, the IP Address assigned by the IT Administrator of the network at the site will need to provide this IP Address. This IP Address will need to be setup using the HP Toolbox setup software on a PC, that is temporarily connected to the HP LaserJet printer. That IP Address will also have to be entered in the Export/Print configuration page on the system.*

6. In order for the z.one_{pro} to communicate with the HP LaserJet printer, it must be on the same subnet. This is accomplished by programming an IP Address into the z.one_{pro} (on the **System Setup** -> **Network** page) that is one value greater than the IP Address of the HP LaserJet printer.

To configure this IP Address into the system

1. Go to the “NETWORK CONFIGURATION” page on the z.one_{pro} by executing the following sequence:

System Setup ->Archive-> Network

Network Configuration Page

2. Using the arrow cursor and SET key, check the box for “**USE SPECIFIED**”
3. In the data entry box to the right of the “**USE SPECIFIED**” checkbox, enter in an IP Address that is one greater then the value of the HP LaserJet printer (i.e printer: **192.168.1.1**, z.one_{pro} **192.168.1.2**)
4. Select “**APPLY**”, to save the settings

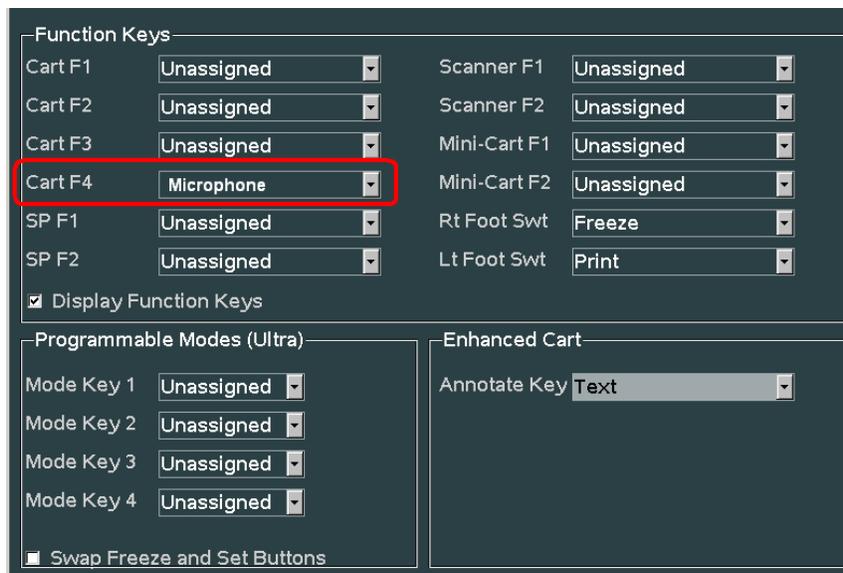
Printing Reports:

1. Perform the desired calculations and measurements on the system.
2. At the conclusion of the measurement process, to manually trigger the print of an Report, select the “**PRINT**” softkey, in the **Calculations->Report** page
3. IF the Report printing was configured for “Print at end of exam”, the Report will automatically be output to the HP LaserJet, upon ending the current exam.

SYSTEM SETUP Sub-Menu



1. Using the trackball scroll down to backlight the **Keys** selection, and press one of the **SET** keys  to bring up the configuration menu.

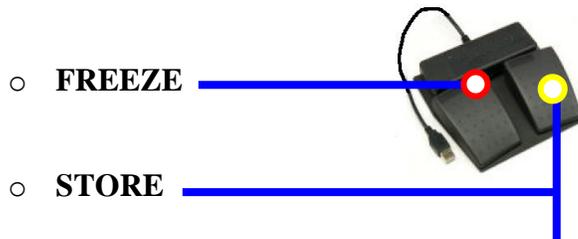


2. For the desired **Function Key (F1 – F4)** selection, select the **MICROPHONE** function from the *pull-down* menu
3. To save the Function Key assignment, select **APPLY** from the main menu, and press one of the **SET** keys  to save new setting.

Pedal Footswitch

A remote 2-pedal footswitch is optionally available for connection to the system via any available USB port. The left and right pedals may be individually configured to one of forty-four possibilities including **Freeze** and **Store** .

The two normal user interface buttons/functions used for the optional footswitch control; are as follows:



The footswitch connects to the system using a USB port on the rear of the Cart, and is a “plug-n-play” device that does not require any menu configuration on the system to operate.

Backup Operations

Backing up customized User “Presets” and “System” settings:

1. If there are customized User “Presets” and/or customized User “System” settings that are desired to be backed up, insert a target USB stick for backup into the USB port on the front or rear of the system.
2. Press SETUP button and use trackball to select “**PRESET ADMIN**” menu and perform the “**BACKUP PRESETS**” operation, and/or “**BACKUP SYSTEM**” operation

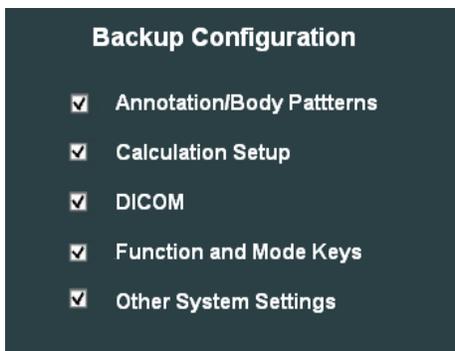
• **BACKUP PRESETS:**

The PRESETS backup operation is all-inclusive, capturing all imaging Preset parameters. No additional pop-up menu for offering granularity for the PRESETS backup is offered.

• **BACKUP SYSTEM:**

The backup SYSTEM operation provides capability for selecting the granularity for the specific parameters that will (or will not) be used during the Backup operation. The selectable options, and a description of what parameters are included in each item, are listed below:

- Annotation/Body Patterns:** User Annotation and customer Body Markers
- Calculation Setup:** User Calculation setup parameters
- DICOM:** Network, General, Network Store, Printers, Worklist, MPP pages
- Function and Mode Keys:** F1-F4, and Mode key functional assignments
- Other System Settings:** All System related parameters NOT captured in the 4 categories above. A few examples are listed below:



- Institution name
- Store/Print keys
- Audio/Video settings
- Power Save settings

RESTORE Operations:

1. With the same USB stick still inserted, go to the Setup “**PRESET ADMIN**” menu and perform the “**RESTORE PRESETS**” and “**RESTORE SYSTEM**” operations.
2. The restore operations (in 5.0 > SW) provide capability for selecting the granularity for the specific parameters that will (or will not) be used during the Restore operations. The selectable options, and a description of what parameters are included in each item, are listed below:

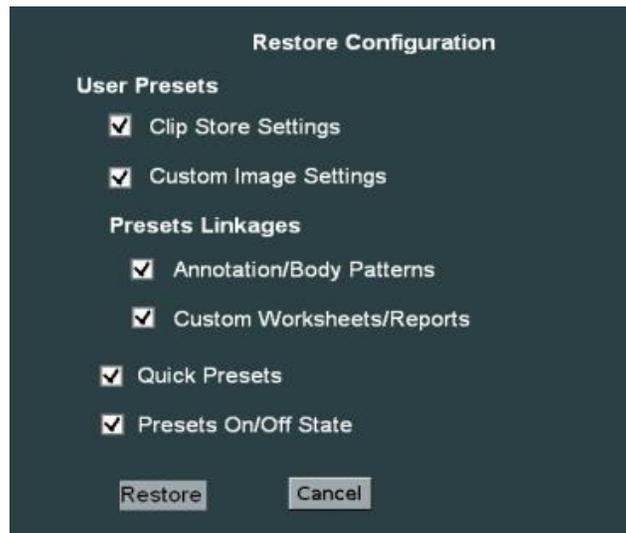
- **RESTORE PRESETS:**

- Clip Store Settings:** User clip store duration or beats cine capture parameters
- Custom Image Settings:** User customized image settings (Invert, Dynamic Range, Depth, etc)
- Quick Presets:** User configuration for exam preset selections assigned to scanner Touchscreen ICONS and z.one_{pro} OLED display
- Presets On/Off State:** User configuration of hiding or displaying of User presets in Preset menu

PRESET LINKAGES:

Preset Linkages allow for determining whether specific transducer type/exam type presets are linked directly to specific annotation and custom worksheets/report (or not), as part of the Preset “RESTORE” process. Checking of the box associated with each category will result in Preset Linking configuration being actively restored.

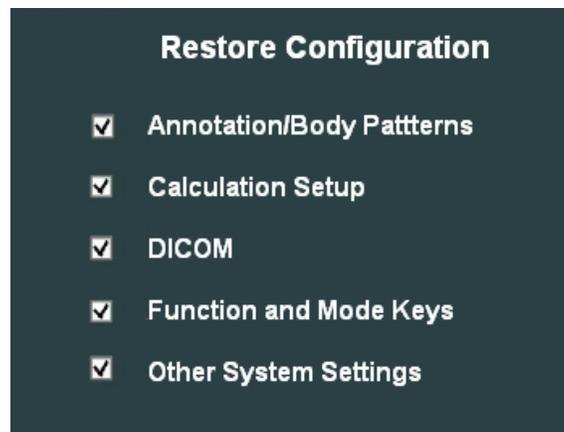
- Annotation/Body Patterns:** User Annotation and customer Body Markers (linked)
- Custom Worksheets/Reports:** QPath custom worksheets and reports (linked)



- **RESTORE SYSTEM:**

The selectable options for the “*RESTORE SYSTEM*” operation, and a description of what parameters are included in each item, are listed below:

- Annotation/Body Patterns:** User Annotation and customer Body Markers
- Calculation Setup:** User Calculation setup parameters
- DICOM:** Network, General, Network Store, Printers, Worklist, MPP pages
- Function and Mode Keys:** F1-F4, and Mode key functional assignments
- Other System Settings:** All System related parameters NOT captured in the 4 categories above. A few examples listed below:
 - Institution name
 - Store/Print keys
 - Function keys
 - Audio/Video settings
 - Power Save settings



Standard Software Installation Procedure

1. Connect a transducer to the system (if not currently attached)
2. Press the Power On/Off button to power the system on
3. Allow the system to complete a normal boot operation (less than 1 minute)
4. Insert the USB Memory Stick (containing system software installer files) into the USB port, pressing lightly to ensure it is seated in the connector
5. An initial software install alert message screen should appear on the LCD display
6. To begin the software install process, at each of the two (2) alert screens, press one of the **SET**

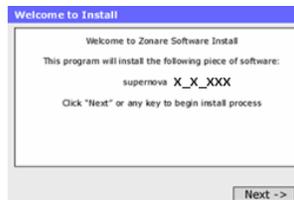
keys 

NOTE: *If it is determined that the software revision of the USB Memory Stick is not the desired version for installation, and it is desired to abort (select the “NO” option) the install operation (or abort it for any other reason), press Cancel, then manually remove the USB Memory Stick.*

7. The following initial software installation screen should appear, and be displayed for a few seconds on the LCD Display

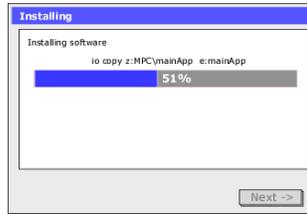


8. A final “*Welcome to Install*” screen should appear



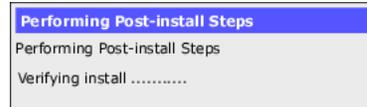
9. Press the one of the **SET** keys  (or “ENTER”  key) again to begin the software installation process.

10. The in-process installing status screen should appear, with a bar graph indicating a dynamic percent completion status

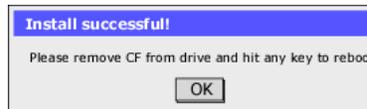


NOTE: *The main application install process should complete in approximately 5 minutes.*

11. After file installation is completed, the system will run a brief install verification process. The following screen will appear during this verification



12. At the completion of a successful software installation/verification process, a dialogue box with the following message should appear on the LCD Display screen



13. Remove the USB Memory Stick from the system.

14. Press the one of the **SET** keys   (or "ENTER"  key) again to finalize the software installation. The system should perform an automatic reboot, powering back up in a fully operational condition.

“Clean” Software Install Procedure

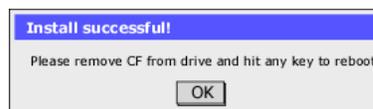
1. Press the Power On/Off button to power the system on
2. Allow the system to complete a normal boot operation (less than 1 minute)
3. Insert the USB Memory Stick (containing system software installer files) into any one of the four USB ports at the rear of the z.one_{pro}, pressing lightly to ensure it is seated in the connector
4. Pressing the “**SERVICE**” key, on the upper row of the QWERTY keyboard on the z.one_{pro}, will immediately bring up the main **User Diagnostic Panel** page.



5. Select the “**MAINTENANCE**” softkey option, to bring up that page.
6. Select the “**SERVICE REBOOT**” softkey. The system will shutdown, and reboot into the special BOOT-APP option screen
7. Press the “**OPTIMIZE**” key, to enable the “**CLEAN INSTALL**” option to appear in the menu.
8. Press the “**F1**” key, to begin the Clean software install process.
9. At each of the two (2) alert, press the “**ENTER**”  key on cart to continue through the install operation to completion.

NOTE: *If it is determined that the software revision of the USB Memory Stick is not the desired version for installation, and it is desired to abort (select the “NO” option) the install operation (or abort it for any other reason), press the “BACK”  key, then manually remove the USB Memory Stick..*

10. At each of the two (2) alert, press the “**ENTER**”  key on cart to continue through the install operation to completion.
11. At the completion of a successful software installation/verification process, a dialogue box with the following message should appear on the LCD Display screen



12. Remove the USB Memory Stick, and press the “ENTER”  key on cart again to finalize the software installation. The system should perform an automatic reboot, powering back up in a fully operational condition

ZONARE FTP Site

SPECIAL INFO



- *ZONARE’s FTP site is provides global access to system software revisions.*
- *This tool is intended to allow direct access for downloading of file provided by ZONARE Tech Support, (like downloads of new System Software).*
- *The site is also provides space for uploading files to ZONARE Tech Support (i.e. image files for review).*
- *To ensure security, a User Name and Password are required.*

➤ Access to ZONARE FTP Site

1. Go to the START box at the bottom of the screen of your PC and start up **Windows** “Explorer”.
2. Enter the following URL information into the “ADDRESS” box of Windows “Explorer”:
 - Address: <ftp://12.40.200.87>
3. Enter the following User Name and Password information:
 - User Name: (call Tech Support for current login information)
 - Password: (call Tech Support for current login information)
4. Tech Support window should now be displayed, enabling uploading or downloading of files

“DIAGNOSTIC” Panel Operations

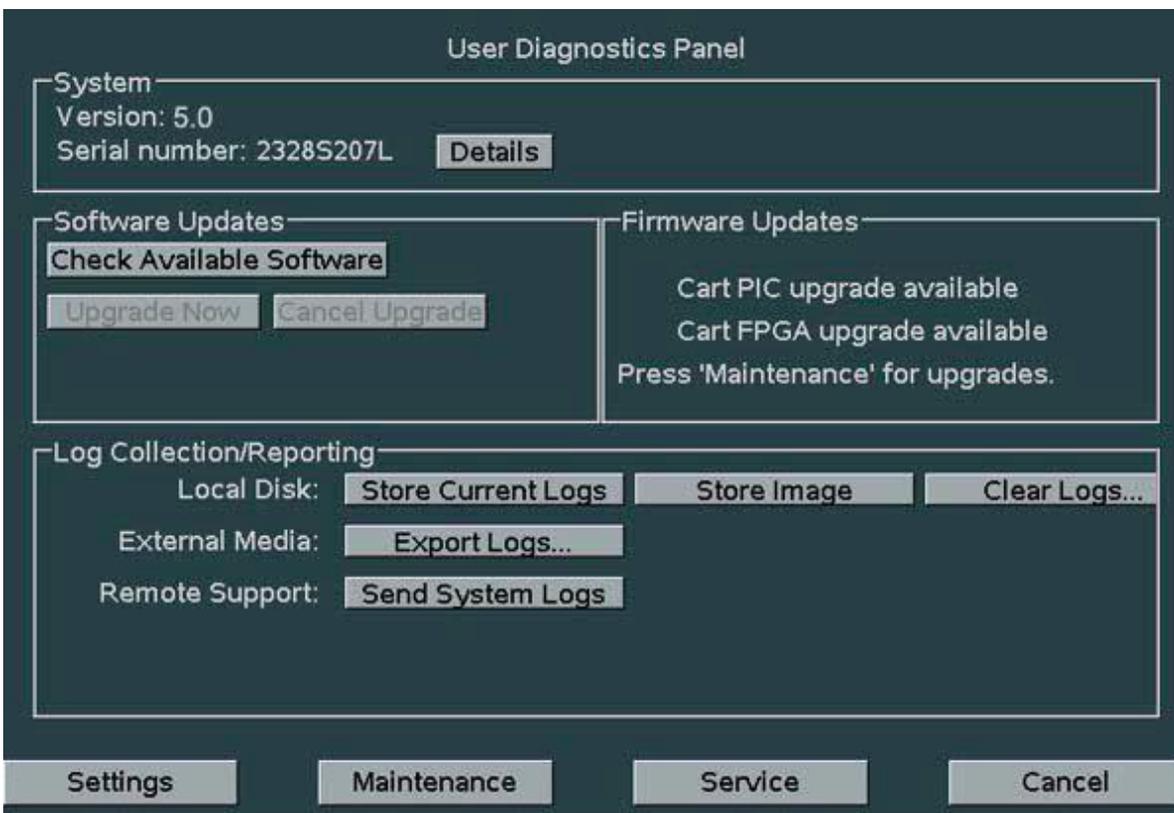
The **User Diagnostics Panel** allows service personnel access to important system information and the ability to perform service support processes.

➤ To access the User Diagnostic Panel

1. While viewing an imaging display, press the Service key on the QWERTY keyboard:



- A single short press activates the User Diagnostics Panel.
 - A long press (1 sec.) stores the current logs; the system beeps as logs are stored.
 - An extended press (> 3 sec.) will initiate an immediate manual capture of the system error logs.
2. Press **Service** again to return to imaging.



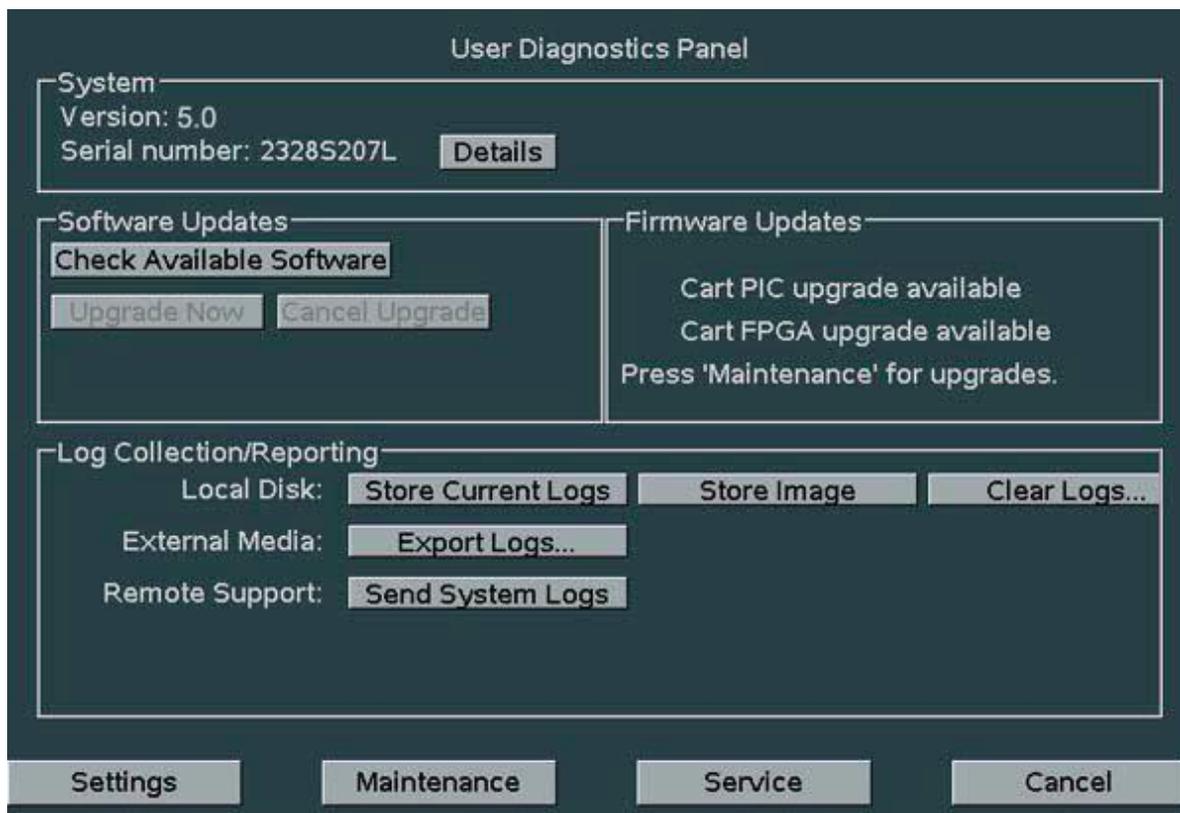
The **Diagnostics** menu on the z.one_{pro} offers (or will offer in subsequent software/hardware releases) the following functionality:

- Display system serial number
- Display system software revision level
- Display the revision level of major PC boards

- Display system status to log files
- Capture current image screen and storing as a BMP file
- Transfer the contents of the internal log directory (using an internet connection) to the ZONARE FTP site
- Check (over the internet) for availability of software and firmware (cart) updates from the ZONARE FTP site

NOTE: The majority of the functions in the User Diagnostics Panel involves the use of an internet connection between the z.one_{pro} system and ZONARE’s network server for uploading or downloading files. Performing any of these procedures requires contacting ZONARE Technical Support to received specific information on IP address and log in used to make the connection.

The features in the User Diagnostics Panel are described



Parameter	Description
System	<ul style="list-style-type: none"> ▪ The current software revision and system serial number appear here. ▪ Click the Details button for PC board revision information.

	<div style="border: 1px solid black; padding: 5px; background-color: #f0f0f0;"> <p style="text-align: center;">Details</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>BOOTAPP</td><td></td><td>4.35</td></tr> <tr><td>USB_CONTROLLER</td><td></td><td>ISP1564</td></tr> <tr><td>CART_FPGA</td><td>22</td><td>3.7.0.3</td></tr> <tr><td>MONITOR_FIRMWARE</td><td>2</td><td>2.1</td></tr> <tr><td>DIGITAL_BOARD</td><td>80250</td><td>7</td></tr> <tr><td>POWER_BOARD</td><td>80021</td><td>REV-2C</td></tr> <tr><td>PIC</td><td></td><td>48</td></tr> <tr><td>VOLT_SUP</td><td></td><td>4</td></tr> <tr><td>STRIKER</td><td></td><td>3.8.18</td></tr> <tr><td>PIC_CART</td><td></td><td>10</td></tr> <tr><td>HYDRA</td><td></td><td>2.1.30</td></tr> <tr><td>DOCK_BOARD</td><td>85013</td><td>REV-3G</td></tr> <tr><td>CF_MODEL_VERS</td><td>INC 2G</td><td>241-0230</td></tr> <tr><td>XDCR_BOARD</td><td>84002</td><td>con_A Mux_A</td></tr> <tr><td>ANALOG_BOARD</td><td>80057</td><td>REV-4B</td></tr> </table> <p style="text-align: center; margin-top: 10px;"><input type="button" value="OK"/></p> </div>	BOOTAPP		4.35	USB_CONTROLLER		ISP1564	CART_FPGA	22	3.7.0.3	MONITOR_FIRMWARE	2	2.1	DIGITAL_BOARD	80250	7	POWER_BOARD	80021	REV-2C	PIC		48	VOLT_SUP		4	STRIKER		3.8.18	PIC_CART		10	HYDRA		2.1.30	DOCK_BOARD	85013	REV-3G	CF_MODEL_VERS	INC 2G	241-0230	XDCR_BOARD	84002	con_A Mux_A	ANALOG_BOARD	80057	REV-4B
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ANALOG_BOARD	80057	REV-4B																																												
Software Updates	<ul style="list-style-type: none"> ▪ Check FTP for latest available software. ▪ If new version available, then option to download to USB media from FTP site. 																																													
Firmware Updates	<ul style="list-style-type: none"> ▪ Check for firmware updates for cart assemblies ▪ Press Maintenance button to perform available updates. 																																													
Store Current Logs	<ul style="list-style-type: none"> ▪ Captures system log files and store to internal archive 																																													
Log Collection/Reporting	<ul style="list-style-type: none"> ▪ Captures system log files ▪ Capture current image screen ▪ Export logs to USB memory stick or other external media ▪ Clear log files from disk ▪ Manually push error logs to FTP server 																																													

The additional functions available beyond the main page of the User Diagnostic Panel, in these three sub-menus, are as defined below:

SETTINGS

1. Click **Settings** on the User Diagnostic Panel.
2. Select the desired settings and click **Apply**.

Remote Support Settings for System upgrades; User name and Password supplied by ZONARE Service

Remote Support Settings for System logs; User name and Password supplied by ZONARE Service

Auto Logging can be set by User; schedules when System logs and errors are sent to ZONARE Service. Factory default: Auto and Error Logging are OFF

The screenshot shows a 'Settings' window with two main sections:

- Software Upgrade Options:**
 - FTP IP Address: 12.40.200.87 (with a Ping button)
 - User Name: 47SW (with a Password field containing asterisks)
 - Auto notify of software updates
 - Remind every 1 days after first notification
- Log Reporting Options:**
 - Enable sending logs to remote FTP site
 - Display Service key log dialog info
 - FTP IP Address: 12.40.200.87 (with a Ping button)
 - User Name: LOGS (with a Password field containing asterisks)
 - Auto Logging:
 - Daily
 - Every 1 Weeks on Monday
 - None
 - Auto Log Time: Hour (0-23): 0 Minutes (0-59): 0
 - Error Logging: Send logs on error

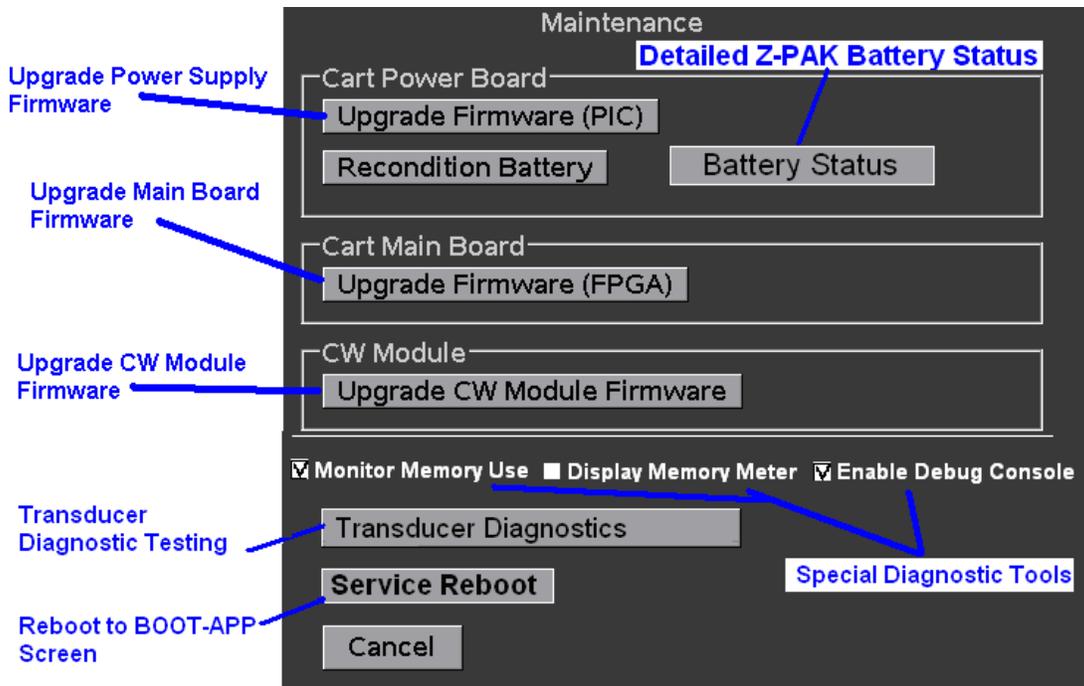
At the bottom, there is a section for **FTP Data Transfer Mode:** with radio buttons for Active and Passive.

Parameter	Description
Software Upgrade Options	<ul style="list-style-type: none"> ▪ FTP Address 12.40.200.87, user name 50 SW and password support are supplied by ZONARE. Click Ping button to test connectivity to software folder on FTP site. ▪ Select the Auto notify of software updates to check FTP server for the latest software revisions and then select the number of days until next check.
Log Reporting Options	<ul style="list-style-type: none"> ▪ Select to enable sending logs to remote FTP site. ▪ Select Display service key log info dialog. This allows a pop-up box when logs are captured for user to enter a message. ▪ FTP Address 12.40.200.87, user name LOGS and password support are supplied by ZONARE. Click Ping button to test ▪ Select Auto Logging to have system automatically send logs.

	<p>You can select daily, every xx weeks on yy day of the week.</p> <ul style="list-style-type: none"> ▪ Select Auto Logging Time to have logs automatically sent at a certain time of day. ▪ Select Error Logging to have logs automatically sent when error occurs.
--	--

MAINTENANCE

1. Click **Maintenance** on the User Diagnostics Panel.
2. Select the desired features and click **Apply**.



Parameter	Description
Cart Power Board	<ul style="list-style-type: none"> ▪ Select Upgrade Firmware (PIC) to update power supply firmware. ▪ Select Recondition Battery to start recondition cycle on cart battery. May take 13+ hours to complete. ▪ Select Battery Status to view cart battery values

Battery Status

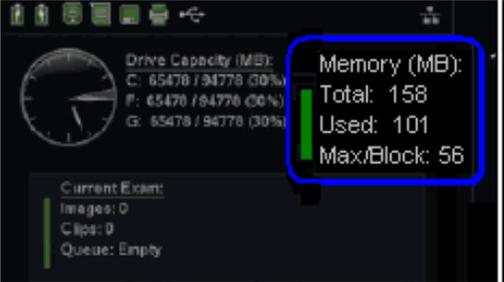
Battery is present
 AC is present
 VWALL 24.2V (112)
 Battery Voltage 17.5V (50240)
 Battery Temperature 26.5C
 Charging State Maintenance (5)
 Gauge Nominal Capacity 12514 mA hours (40047)
 Gauge LMD 12960 mA hours (162)
 Battery Charge 96% (calculated)

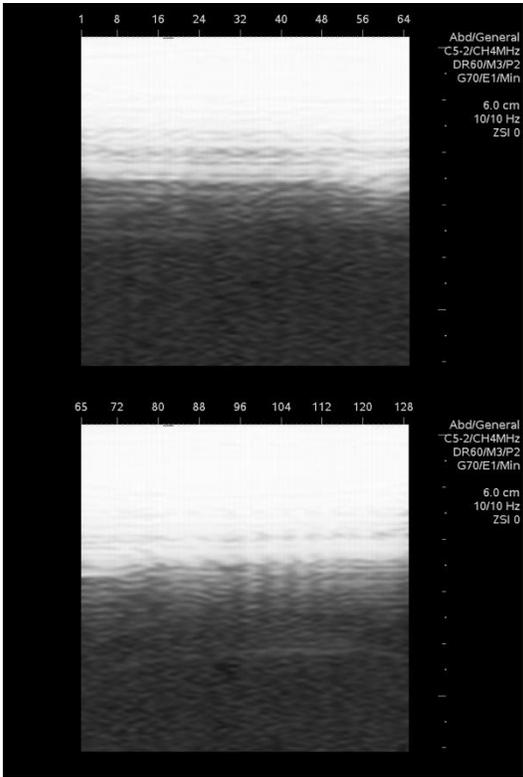
OK

- VWALL: 24V +/- 5% (only when AC present)
 - Battery Voltage: 14 – 21V
 - Battery Temperature: 27 °C / 0 to 45 °C
 - **Charging State:**
 - OFF ----- 0
 - SOFT_START ----- 1
 - TOP_OFF ----- 2
 - RAPID_CHARGE ----- 3
 - TRICKLE ----- 4
 - MAINTENANCE ----- 5
 - RECONDITION ----- 6
 - COOL_DOWN ----- 7
 - DRIVE_DONE ----- 8
 - RECONDITION_INIT ----- 9
 - Gauge Norminal Capacity 0 – 13,000 mA hours
 - Gauge LMD
 - Battery Charge **12960**
nominal / ***10368 to 15552**
- * Below this range would be considered a ‘bad’ (needing replacement) battery.
- Above this range should be considered an invalid value.

Cart Main Board

- Select Upgrade Firmware (FPGA) to update main board firmware.

<p>Monitor Memory Use</p>	<ul style="list-style-type: none"> Enables internal processes where on-screen warning messages are displayed, and/or a forced system restart is performed, if maximum available block size drops below certain thresholds. <p>Memory status checking will occur at each of the following intervals/events:</p> <ol style="list-style-type: none"> 1) Storing an image 2) Activating/Connecting a transducer 3) Starting or Ending an exam <ul style="list-style-type: none"> <u>Memory Usage Warnings/Actions:</u> The following milestone actions will occur when the “Monitor Memory Use” function is enabled. <p>CAUTION – Level 1</p> <ul style="list-style-type: none"> The system will display a caution message dialog box, ONCE per exam, when the largest available memory block size falls below 10MB. The system will continue to be available for use after accepting the message <p>WARNING – Level 2</p> <ul style="list-style-type: none"> The system will display a warning message dialog box when the largest available memory block falls below 5MB. When the dialog is dismissed, the system will perform an automatic power-cycle “Restart” If an exam with stored images was in progress when the system restarted, due to insufficient memory, a dialog message will appear prompting the user to resume the current exam.
<p>Display Memory Monitor</p>	<ul style="list-style-type: none"> Displays active memory usage parameters within Dashboard area on monitor 

	<ul style="list-style-type: none"> ▪ Total: Total available memory size in scanner (in MB) ▪ Used: Total currently used memory size in scanner (in MB) ▪ MaxBlock: Largest memory block size (in MB)
Enable Debug Console	<ul style="list-style-type: none"> ▪ Allows (if checked) or disables (if unchecked) access to the System Console window (ALT-GR / Shift / Z keys) for entering low-level commands for service. Lock-out offered due to same key combination used for international character text entry during normal use.
Transducer Diagnostics	<ul style="list-style-type: none"> ▪ Displays a linear image format for all transducer types, to identify possible missing channels/elements. ▪ Pressing the “SET” key will toggle between the two testing segment screens (element 1-64, 65-128), to cover all elements in the transducer under test.
	<ul style="list-style-type: none"> ▪

15 SYSTEM MAINTENANCE

This section describes the maintenance, care and service required to maintain the z.one_{pro} system in proper operation. Refer to the z.one_{pro} Operator Manual for the latest instructions.

- Navigating user diagnostics settings
- Backing up and restoring user presets and system settings
- Upgrading software
- Caring of the system



WARNING: Shock hazards exist if the AC power connection for the z.one_{pro} system or AC adapter are not properly grounded. Equipment must be connected to a *hospital grade* receptacle. Do not remove the grounding wire.

The enclosures contain no operator-serviceable components other than the scanner module.

- To avoid electrical shock, do not remove covers other than the scanner module cover.
- For servicing, contact Mindray Technical Support only. Failure to do so may void your warranty or service contract coverage.

To safely use and maintain the system:

- To avoid electrical shock, always disconnect the AC power before cleaning any part of the z.one_{pro} system.
- Do not immerse the transducer past the cleaning/disinfection level depth specified in “[Cleaning and Disinfecting Transducers.](#)” Do not immerse the transducer for longer than specified cleaning/disinfecting time. Do not use any transducer that has been immersed beyond the Improper cleaning or disinfection of any part of the z.one_{pro} system can cause permanent damage. Follow the cleaning and disinfection instructions.



CAUTION: Do not excessively twist or bend the cables; this can cause failure

- Improper cleaning or disinfection of any part of the z.one_{pro} system can cause permanent damage. Follow the cleaning and disinfection instructions
- Do not use solvents or abrasives to clean any part of the z.one_{pro} system.
- Do not spill liquid on the z.one_{pro} system.
- Do not immerse the battery in water or allow it to get wet.
- Do not put the battery into a microwave oven or pressurized container.
- Use only ZONARE batteries.
- Store the battery between 32F and 120F (0 and 50C).
- If the battery leaks, emits odors, emits heat, or is deformed or discolored in any way, immediately stop using the battery.

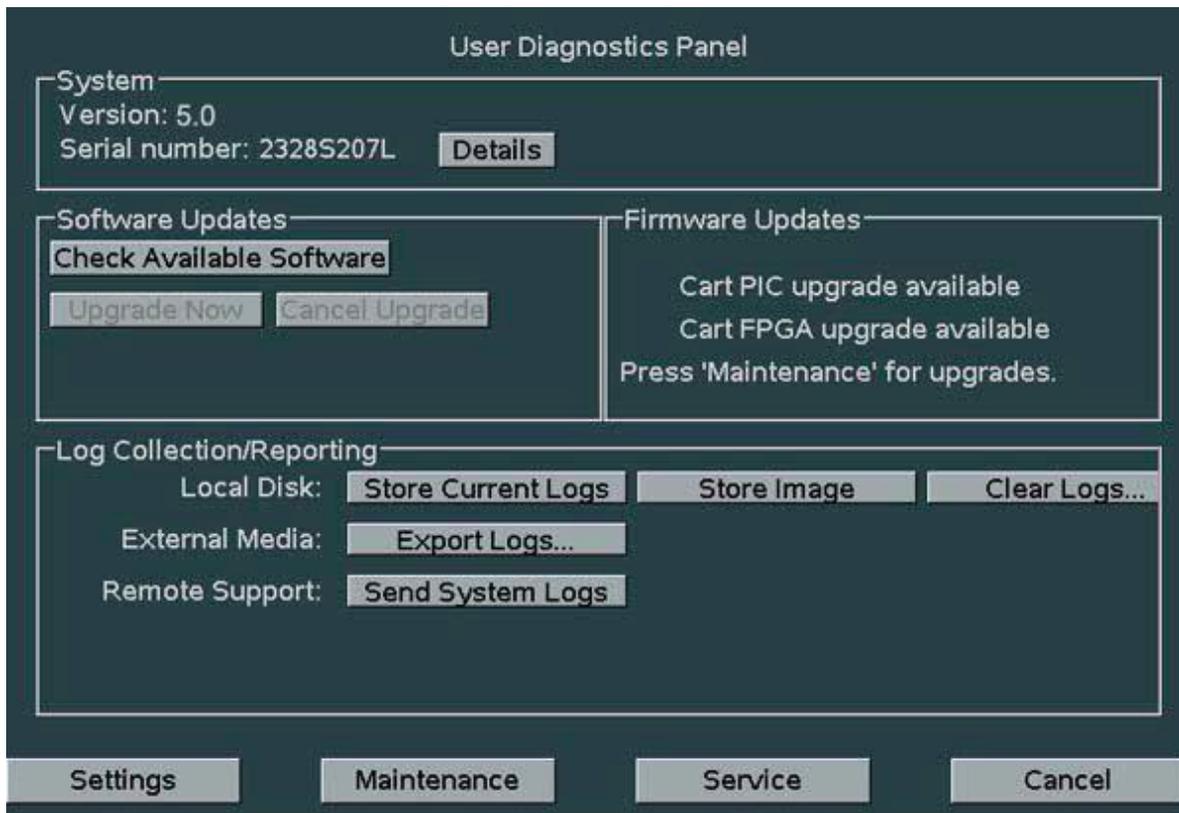
User Diagnostics Panel

The **Diagnostics** menu on the z.one_{pro} offers (or will offer in subsequent software/hardware releases) the following functionality:

- Display system serial number
- Display system software revision level
- Display the revision level of major PC boards
- Display system status to log files
- Capture current image screen and storing as a BMP file
- Transfer the contents of the internal log directory (using an internet connection) to the ZONARE FTP site
- Check (over the internet) for availability of software and firmware (cart) updates from the ZONARE FTP site

NOTE: The majority of the functions in the User Diagnostics Panel involve the use of an internet connection between the z.one_{pro} system and ZONARE's network server for uploading or downloading files. Performing any of these procedures requires contacting ZONARE Technical Support to received specific information on IP address and log in used to make the connection.

The features in the User Diagnostics Panel are described



Parameter	Description
System area	<ul style="list-style-type: none"> ▪ The current software revision and system serial number appear here. ▪ Click the Details button for PC board revision information.
Software Updates	<ul style="list-style-type: none"> ▪ Check FTP for latest available software. ▪ If new version available, then option to download to USB media from FTP site.
Firmware Updates	<ul style="list-style-type: none"> ▪ Check for firmware updates for cart assemblies ▪ Press Maintenance button to perform available updates.
Store Current Logs	<ul style="list-style-type: none"> ▪ Captures system log files and store to internal archive
Log Collection/Reporting	<ul style="list-style-type: none"> ▪ Captures system log files ▪ Capture current image screen

-
- | | |
|--|--|
| | <ul style="list-style-type: none">▪ Export logs to USB memory stick or other external media▪ Clear log files from disk▪ Manually push error logs to FTP server |
|--|--|
-

To access the User Diagnostic Panel

1. While viewing an imaging display, press the Service key on the QWERTY keyboard:



- A single short press activates the User Diagnostics Panel.
 - A long press (1 sec.) stores the current logs; the system beeps as logs are stored.
 - An extended press (> 3 sec.) will initiate an immediate manual capture of the system error logs.
2. Press **Service** again to return to imaging.

For detailed information on use of the “**Diagnostic Panel**” screen, refer to Section 0 of this manual.

(Exam) Preset Mgmt/System Setup

The z.one_{pro} system has two categories of customized parameters that you can create and configure.

- **(Exam) Preset Mgmt category:** Customized image setup parameters (depth, frequency, etc.) that you can create for each transducer for each mode of operation. These customized user presets allow for a one-time setup of commonly used configurations and control settings.
- **System Setup category:** Configurable settings including parameters such as institution name, date/time, DICOM settings, function and mode key assignments, and calcs.

To protect these customized parameters, you should save them on a regular basis whenever you make changes to removable media (e.g., USB memory stick). You can use the removable media to instantly restore the z.one_{pro} system to its complete previous operating configuration in the case of a post-software upgrade.

To create or modify (exam) presets, simply make the imaging changes to the (exam) preset. Go to the (Exam) Presets tab and scroll down to **Preset Mgmt**. Choose **Create** or **Modify** to make the new preset.

Backing Up (Exam) Preset Mgmt/System Setup

You can back up the (Exam) Preset Mgmt and System Setup categories to removable media using the steps below.

➤ To Back Up (Exam) Preset Mgmt

1. Power on the z.one_{pro} system and allow it to fully boot.

2. Insert the presets/system backup removable media into the USB port at the rear of the z.one_{pro} system.
3. When a popup window appears saying **Install media detected. Do you wish to install new software?** highlight **No** and press one of the **SET** keys .
4. Press the **Setup** button.
5. Highlight **Preset Admin** and press one of the **SET** keys  to activate.
6. Highlight **Backup Presets** and press one of the **SET** keys  to initiate the storage of user presets to the removable media.

➤ **To Back Up System Setup**

1. Power on the z.one_{pro} system and allow it to fully boot.
2. Insert the presets/system backup removable media into the USB port at the rear of the z.one_{pro} system.
3. When a popup window appears saying **Install media detected. Do you wish to install new software?**, select **No** and press the **Set** button.
4. Press the **Setup** button.
5. Highlight and select **Preset Admin**.
6. Highlight **Backup System** and press the **Select** button to initiate the storage of system settings to the removable media.

Restoring (Exam) Preset Mgmt/System Setup

You can restore (Exam) Preset Mgmt and System Setup categories using the removable media where you backed up the data.

➤ **To Restore (Exam) Preset Mgmt**

1. Power on the z.one_{pro} system and allow it to fully boot.
2. Install the removable media containing the previously backed up (exam) presets into the USB port at the rear of the z.one_{pro} system.
3. When a popup window appears saying **Install media detected. Do you wish to install new software?**, Highlight **No** and press one of the **SET** keys .
4. Press the **Setup** button.
5. Highlight **Preset Admin** and press one of the **SET** keys  to activate.
6. Highlight **Restore Presets** and press one of the **SET** keys .
7. When a window appears asking if you want to restore **All**, **Exam Type**, or a **Single Preset**, select one of the above, make your changes, and press **Apply**.

➤ To Restore System Setup

1. Power on the z.one_{pro} system and allow it to fully boot.
2. Install the removable media containing the previously backed up system setup parameters into the USB port at the rear of the z.one_{pro} system.
3. When a popup window appears saying **Install media detected. Do you wish to install new software?**, Highlight **No** and press one of the **SET** keys .
4. Press the **Setup** button.
5. Highlight **Preset Admin** and press one of the **SET** keys  to activate.
6. Highlight **Restore System**, and press one of the **SET** keys  or **vcv** to initiate the retrieval of the system setup parameters from the removable media.
7. When a window appears asking **Are you sure you want to overwrite the system preset contents?**, select **Yes/No** and press the **Set** button.

NOTE: A system restore includes everything under System Setup such as networking, DICOM, function and mode keys, and **Calcs**.

Software Upgrade/Installation

ZONARE periodically releases new software for your system. The upgrade procedure is easy and you can do it yourself. Total installation time is approximately 15 minutes.

The method for accessing system software upgrades for installation at a user site is directly dependent upon the network and computer equipment present at the site. The options are:

- **Best option (fastest):** Direct FTP download (over the Internet) of system software to an installed removable media using a network connection on the z.one_{pro} system.
- **Second best option:** Local laptop/PC FTP site download (over the Internet) of system software to a locally installed removable media.
- **Basic option (slowest):** Ground shipment of removable media, preloaded with system software installer files, to the user site.

For information on the latest software revision level, contact Mindray Technical Support:

- 1-877-913-9663 (USA and Canada)
- 1-650-316-3199

Verifying Current System Software Revision

➤ To Verify Current Software Revision

The software revision is displayed in the top left corner of the User Diagnostics Panel (section 14.1). The installed software level is indicated by a series of digits, for example, 5.0.xxx.

Use one of these methods to access the User Diagnostics Panel:

- Quickly press the **Service** key on the QWERTY keyboard.
- Go to **Setup button | System Setup | Diagnostics**.
- Go to **System Setup | Diagnostics**.

Installing System Software

➤ To Install System Software

1. Power on the z.one_{pro} system
2. Insert the removable media (USB memory stick) into a USB port on the rear of the z.one_{pro} system, pressing lightly to ensure that it is seated.
3. To begin the software installation, press the **Select** button for each of the two dialog boxes that are sequentially displayed.
 - System license verification
 - Software file transfer (download)
 - Software validation **NOTE:** If the software revision of the removable media is the same as the current version and you want to cancel, select **No**. If you want to cancel for any other reason, press the **Back** key and then manually remove the removable media. The software install process includes these stages:
4. When the software is successfully installed, a dialog box is displayed on the LCD screen, instructing you to remove the removable media and press any key to reboot.
 - Remove the removable media from the z.one_{pro} system.
 - Press any key on the system to reboot, and begin normal operation. A software installation dialog box is displayed on the LCD display: **Install media detected. Do you wish to install new software: Yes/No** The complete software download takes approximately 5 minutes.

Basic System Care

LCD Display Cleaning



WARNING: Take care not to damage or scratch the glass or LCD panel. Do not apply pressure on the glass or LCD panel. Do not apply or spray liquid directly to the glass, panel, or cabinet as excess liquid can cause damage to internal electronics. Apply the liquid to the cleaning cloth.

WARNING: Do NOT use any of the following:

- Lye or cleaning solutions containing lye
- Acid
- Detergents with fluoride
- Detergents with ammonia
- Detergents with abrasives
- Steel wool
- Sponge with abrasives

- Cloth with thread made of steel
- Other coarse tools
- Do not autoclave, immerse, or attempt to sterilize the LCD display.

To Clean Front Glass

1. Before cleaning, turn off the AC circuit breaker on the z.one_{pro} system to remove all power from the unit.
2. Clean the glass using a soft cotton cloth lightly moistened with a watery solution or a mild commercial glass-cleaning product suited for coated glass surfaces.



CAUTION: Spray cleaning solution on the cloth, NOT on the display.

3. Wipe dry with a clean, dry, soft, lint-free cloth.

To Clean External Case

1. Before cleaning, turn off the AC circuit breaker on the z.one_{pro} system to remove all power from the unit.
2. Wipe the z.one_{pro} system surfaces with a safe disinfectant solution such as Sani-Cloth Plus or isopropyl 50% alcohol and follow the disinfectant label instructions for use.
3. Repeat with water only.
4. Wipe dry with a clean, dry, soft cloth.



WARNING: Do not expose the external case of the LCD display to any of the following agents:

- Cidex
- Betadine

General z.one_{pro} Exterior Surface Cleaning

- Do not use disinfectants (such as gluteraldehyde or hydrogen peroxide) or acetone to clean any surfaces on the z.one_{pro} system or its accessories.
- Before cleaning, turn off the AC circuit breaker on the z.one_{pro} system to remove all power from the unit.
- Wipe the z.one_{pro} surfaces with a safe disinfectant solution such as Sani-Cloth Plus or isopropyl 50% alcohol and follow the disinfectant label instructions for use.
- Do not autoclave, immerse, or attempt to sterilize the LCD display or transducers.
- Do not spill or spray liquid directly on the control panel, LCD display, battery charger, AC power adapter, or transducer connector.
- Using soap and water or a mild disinfectant, gently wipe the surfaces of the z.one_{pro} system with a moistened cloth.

- After each use, remove and dispose of any used cover/sheath. Wipe off any excess gel from the transducer and clean it properly.
- Air dry the z.one_{pro} system.



WARNING: To avoid electrical shock before cleaning the z.one_{pro} system, turn off the AC circuit breaker at the rear of the system. Always use protective eyewear and clothing when cleaning or disinfecting the z.one_{pro} system.

- The level of disinfection required for the z.one_{pro} system is dictated by the type of contaminants the system came in contact with.
- If using a premixed disinfection solution, check the solution expiration date to ensure that the solution has not expired. Do not use expired solutions.

Transducer Maintenance

Regularly check transducers for signs of wear or damage.



WARNING: Bent, broken, or missing pins on the transducer connector can cause poor image quality, including possible mirror image artifact. Be sure to check pins before connecting transducer to the z.one_{pro} system. If pins are bent, broken, or missing, do not use the transducer and call ZONARE Technical Support.



15.1.1 INSPECTING TRANSDUCERS

Inspect transducers at least weekly for signs of wear or damage.

- Cracks in case or transducer face
- Cuts, gouges, or holes on any part of the transducer, including transducer face, case, cable, and connector
- Buckling or bulging of the lens material on the transducer face
- Damage to the transducer connector, including bent, broken, or missing pins
- Fluid leaks



WARNING: If damage is evident, discontinue use of the transducer and contact Mindray Technical Support. Immediately replace a transducer that exhibits any damage.

Verifying Imaging Performance

Verify transducers for proper imaging performance at least weekly.

- Scan yourself or a tissue-equivalent phantom with each transducer.
- Verify uniform image quality. Look for signs of drop-out (dark columns in the image area).

15.1.2 GENERAL CLEANING

NOTE: Do not use any cleaner or disinfectant on the transducer pins.

External-use transducers (*curved array, linear array, and phased array*): Mindray recommends cleaning the transducers using the *Wipe Method* after each patient exam. The use of a soft cloth thoroughly moistened with an approved disinfectant is recommended for cleaning the strain relief, transducer housing and cable.

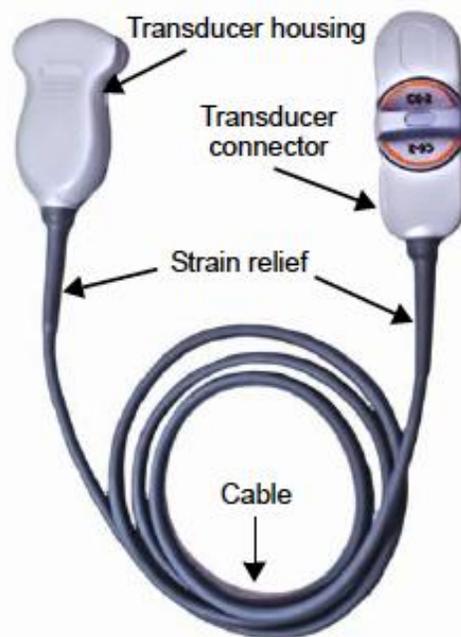
Endocavity probes: Mindray recommends performing the *Immersion Method* of disinfection after each patient exam. The use of a soft cloth thoroughly moistened with an approved disinfectant is recommended for cleaning the strain relief, transducer housing and cable.

NOTE: The transducers cannot be sterilized. When sterility is required, use a sterile transducer cover/sheath and sterile ultrasound/coupling transducer gel. Follow all manufacturer prescribed techniques.

15.1.3 CLEANING & DISINFECTING

➤ WIPE METHOD

1. Disconnect the transducer from the system. If present, remove the transducer cover/sheath and discard.
2. Use a soft cloth dampened with mild soap (Liquinox) and water solution to remove particulate, ultrasound coupling gel, or body fluids.
3. Examine the transducer for damage, such as cracks, holes, or fluid leaks. If damage is evident discontinue use of the transducer and contact **Mindray** Technical Support.
4. Next, Mindray recommends the use of a disinfectant solution to wipe the transducer housing, strain relief, and cable. Follow the manufacturer's instructions for proper cleaning.



Note: A list of approved disinfecting solutions can be found on page

5. Air dry (or towel dry) the transducer with a clean cloth.

➤ IMMERSION METHOD

NOTE: all Transducers may be immersed except for the Aux CW transducer.

1. Disconnect the transducer from the system. If present, remove the transducer cover/sheath and discard.
2. Use a soft cloth dampened with mild soap (Liquinox) and water solution to remove particulate, ultrasound coupling gel, or body fluids.
3. Examine the transducer for damage, such as cracks, holes, or fluid leaks. If damage is evident discontinue use of the transducer and contact **Mindray** Technical Support.
4. Next, Mindray recommends the use of a disinfectant solution to wipe the transducer housing, strain relief, and cable. Follow the manufacturer's instructions for proper cleaning.

Note: A list of approved disinfecting solutions can be found on page

5. Immerse the transducer into the disinfecting solution ensuring it is not immersed below the depth indicated in **Figure 21**. Immersion time should be as recommend by the disinfectant manufacturer.
6. Wipe the surface of the transducer with a soft cloth dampened with a mild soap (Liquinox) and water solution.
7. Wipe the transducer again with a soft cloth soaked with fresh water to remove any residual cleaning solution prior to use on patients.
8. Air dry (or towel dry) the transducer with a clean cloth.



CAUTION: During immersion disinfection, never immerse the transducers longer than 45 minutes. Damage may occur to the transducer housing and/or components if disinfection times exceed these recommended limits.

CAUTION: Using a non-recommended cleaning or disinfectant solution, incorrect solution strength, or immersing the transducer deeper or longer than indicated can damage the transducer.

*CAUTION: To prevent possible damage to the electronics of the transducer, never immerse the transducer beyond the point (10mm below the top edge of the transducer housing), as shown in the **figure 21** below.*

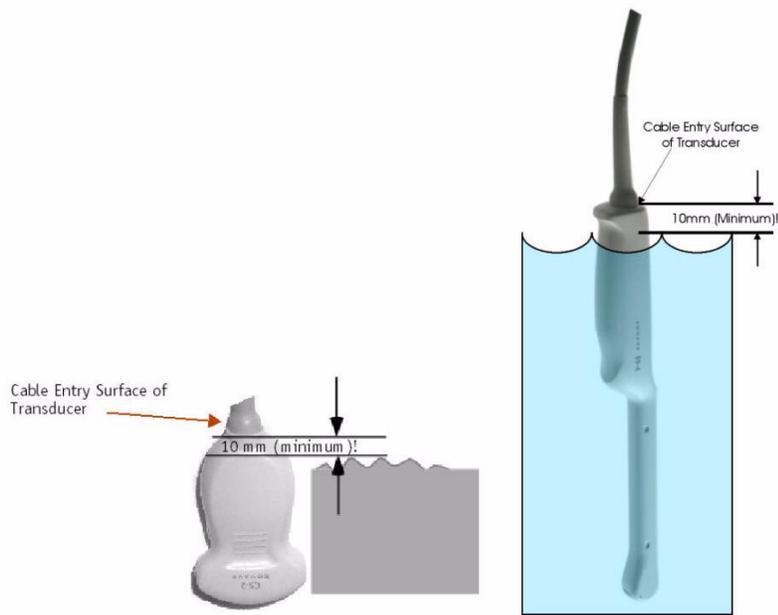


Figure 13: Transducer immersion limits

15.1.4 ZONARE-APPROVED TRANSDUCER DISINFECTANTS

NOTE: For the latest list of transducer disinfectants approved by ZONARE, go to <http://www.zonare.com/support/care> or refer to

16 SYSTEM TROUBLESHOOTING

Many malfunctions are caused by a routine problem, such as power disconnection or the maladjustment of basic imaging or peripheral device (LCD display) controls. Before calling Tech Support, please perform the following troubleshooting procedures on the affected component(s).

The troubleshooting information in this section is intended to assist in diagnosing potential causes of a variety of system problems. It should be noted that as a result of the advanced level of integration in the electronic circuitry of the ultrasound system, the amount service/repair that can be performed in the field, is limited to a specific number of FRU's (Field Replaceable Units).

Technical Support Contact Information

ZONARE Contact Information



SHENZHEN MINDRAY BIO-MEDICAL ELECTRONICS CO., LTD.

Mindray Building, Keji 12th Road South, High-Tech Industrial Park, Nanshan, Shenzhen, 518057,P.R.China

Technical Support

North America:

Phone support: 877-913-9663 or 650-316-3199

Email: techsupport@zonare.com

Sales support: 1-877-966-2731, salesupport@zonare.com

www.zonare.com

Europe and Asia:

Address: Mindray Building, Keji 12th Road South, High-tech industrial park, Nanshan, Shenzhen 518057,P.R.China

Website: www.mindray.com

E-mail Address: service@mindray.com

Tel: +86 755 81888998

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Troubleshooting

TRANSDUCER PROBLEMS



Caution: Bent, broken, or missing pins on the transducer connector may cause poor image quality, including possible mirror image artifact. Be sure to check pins before connecting transducer to the ZONARE ultrasound system. If pins are bent, broken, or missing, do not use the transducer and call ZONARE Technical Support.



Figure 14: Transducer Connector Pin Damage – (Example)

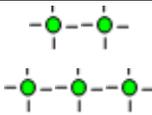
Inspection of Transducers

1. Routinely inspect transducers for the following problems.
 - Signs of wear or damage to the housing, cable, etc.
 - Cracks in case or transducer face
 - Cuts or gouges on any part of the transducer, including transducer face, case, cable, and connector
 - Buckling or bulging of the lens material on the transducer face
 - Damage to the transducer connector, including bent, broken, deformed, or missing pins
2. Immediately replace a transducer that exhibits any of the above damage symptoms

16.1.1 POWER-ON PROBLEMS

System fails to power on

1. Ensure that the AC power is connected to a wall outlet.
2. Ensure the AC power cord is fully seated in the socket on the rear of the cart.
3. Ensure that the circuit breaker (located in the lower-left of the rear panel) is pressed down in the “1” (On) position.
4. With active AC power applied, verify that the LEDs located at bottom/rear of z.one_{pro} system are in the following condition:

LED #	LED	STATUS	Definition
1		“AC Present”	Solid: System has AC Mains applied and 5V standby is active.
			OFF: No AC detected, circuit breaker off
2		“Battery”	OFF: No battery installed, or completely depleted
			Blinking: Battery charging (or reconditioning) in-process
			Solid: Battery is fully charged
3		“Controller Status”	Solid: uCPU is up
4		“Interlocks”	Solid: Module docked and cover “on”
			Blinking: TBD
5		“Vwall”	Solid: AC/DC 24VDC output is active
			OFF: No AC or circuit breaker tripped
6		“Vcart”	Solid: 12V for cart peripherals
			OFF: No power to cart assemblies
7		“Vdock”	Solid: 12V for Scan Module
			OFF: No power to Scan Module

5.

6. If either component fails to start up after these steps, contact Mindray Tech Support.

16.1.2 PERIPHERAL PROBLEMS

➤ 17" Display monitor, no video

- Power down the system, then switch off circuit breaker (at rear of system) to remove power to system electronic.
- Remove cover on back of monitor, and inspect/verify the cable connection.

➤ Sony B/W printer fails to power on

- Check the power cord connections.
- Temporarily connect the power cord of the peripheral to a local receptacle, and test for operation of the peripheral.
- If the peripheral fails to power on after these steps, contact Mindray Tech Support.

➤ Sony B/W printer fails to print

- Check that the printer has paper available.
- Verify power button on printer has been activated.
- Ensure that the USB cable is properly connected on the peripheral device, and connected internally to the dock module and consult following table.

Lamp	Status	Cause/remedies
 (green)	On	Printer powered on
PRINT (green)	On	Printing
	Blinks	Receiving image data
	Blinking slowly	Standing by until the thermal head is ready for printing. Wait until the PRINT lamp lights. Printing resumes automatically.
PAPER (orange)	On	Add or reseal paper roll
ALARM (orange)	On	Door open > close door until it latches.
		Printer malfunction > Turn the printer off and back on. If error persists, contact Sony or

- If the printer fails to print after these steps, contact Mindray Tech Support.

16.1.3 TRANSDUCER PROBLEMS

➤ **Transducer not recognized by system (no B-mode imaging)**

- To ensure a positive connection, disconnect the transducer and reconnect it.
- Inspect the metal contact pins on the connection surface of the transducer connector for bending or other damage.
- To determine a problem with the transducer or system, attach a different transducer.
- Disconnect the transducer. Power off the system. Power the system back on and reattach the transducer to test for functionality.
- If system still fails to operate any transducers, contact Mindray Tech Support.

16.1.4 IMAGING PROBLEMS

No/poor B-mode image

➤ **No/poor Color Mode image or PW Doppler**

- Make sure the brightness and contrast settings of the LCD display have not been altered from proper settings. For information about LCD display settings, see LCD Display.
- To ensure the quality of the gray scale resolution of the LCD display, use the gray scale test pattern (via the Diagnostic menu) that is available. Ensure that all shades can be visualized, making small adjustments to brightness and contrast from factory defaults, as required, to see all intensities.
- Make adjustments to the various Doppler controls (**gain, filter, scale**) to attempt to resolve problem.
- Ensure that the scanning angle between the transducer face and the direction of blood flow is optimized.
- In the on-screen menu, under the **Preset** tab, select one of the factory default settings (General, etc.) to determine possible maladjustment of user presets.
- Ensure that there is an adequate supply of acoustic coupling gel and good patient/transducer contact.
- Switch to a different transducer to determine the problem.

16.1.5 GENERAL OPERATION PROBLEMS

➤ **Function (F1-F4) key(s) do not operate**

- Using the on-screen menu, go to Setup | System Setup | Keys to access the menu for configuring the function keys.

➤ **Unable to modify existing User Preset (grayed out)**

- Make sure the desired user preset was previously (i.e., before attempting to modify it) selected as the active preset.

➤ **System will not communicate with target DICOM” Store” or “Print” device**

- Check Networking ICON  on upper/left corner of main imaging screen, to verify hardware connection is active (no “X” over ICON). Check hardware cabling, network equipment, and/or configuration, as necessary.
- Press the **DICOM Queue** key, and inspect for any pending jobs in the Queue. If any jobs pending, delete them and then power cycle System, and then re-test network state.
- In “**General**” and “**Network**” configuration pages, verify DICOM Application Title, and IP address/gateway/netmask parameters are entered correctly, and correspond with those assigned to z.one_{pro} ultrasound system by the IT Admin at the install site.
- In the DICOM” “**Network Store**” and “**Printer**” configuration pages, verify AE Title, IP Address, and Port Number parameters are entered correctly, and match those assigned to the corresponding device by the IT Admin for facility, at install site.
- Using the “PING” and “VERIFY” selection in the DICOM configuration menus, for the Network Storage or Printer Administration screens (as applicable to device attempting to be connected), test for successful handshaking of connection.
- Using another device (PC, etc.) on same domain on hospital network, perform a “PING” operation to the IP address assigned for the system, in the “Network” configuration page, to test for TCP/IP connectivity.

System Status LED & Error Code Definitions

16.1.6 REAR I/O PANEL – SYSTEM STATUS LAMPS

The seven (7) system status indicator lamps located on rear of the system (panel just above the main AC circuit breaker) can be used to assist in troubleshooting problems with the system. The definition of the each lamp is as shown in the table below:



LED #	LED	STATUS	Definition
1		“AC Present”	Solid: System has AC Mains applied and 5V standby is active.
			OFF: No AC detected, circuit breaker off
2		“Battery”	OFF: No battery installed, or completely depleted
			Blinking: Battery charging (or reconditioning) in-process
			Solid: Battery is fully charged
3		“Controller Status”	Solid: uCPU is up
4		“Interlocks”	Solid: Module docked and cover “on”
			Blinking: TBD
5		“Vwall”	Solid: AC/DC 24VDC output is active
			OFF: No AC or circuit breaker tripped
6		“Vcart”	Solid: 12V for cart peripherals
			OFF: No power to cart assemblies
7		“Vdock”	Solid: 12V for Scan Module
			OFF: No power to Scan Module

16.1.7 SYSTEM ERROR MESSAGE CODES

Error Code	Subsystem	Message for Error log	User Error Message	Action on Action
0xa00d0401	EUSCONTROL	ostr.str()	NOTE: Various messages from function box	
0xa00e0401	DIAGNOSTICS	Detected Bad Channel In ADC Test.	"Detected ADC Error. See Logs for more errors."	Continue
0xa00e0402	DIAGNOSTICS	Checking ADC status Failed	"ADC Test Error In Setup: Test Aborted."	Continue
0xa6010401	CBKEY30A	CB Console INIT error	"CB Console INIT error"	Continue
0xa6020401	CBKEY30A	LCD Comm Error	"IOE30A LCD COMM ERROR"	Continue
0xa6030401	CBKEY30A	SMBUS Error	"IOE30A SMBUS ERROR"	Continue
0xa6040401	CBKEY30A	Init Error	"IOE30A INIT error"	Continue
0xa6040402	CBKEY30A	Batt Status Retrieval Error	"IOE30A BATT STATUS RETRIEVAL ERROR"	Continue
0xaf034005	HSSL_LINK	ostr.str	"Cart Device Initialization Error. If error persists call service."	Continue
0xaf050401	THERMALSERVICES	Fan is stuck	"System fan Error: Please shutdown system."	Stop
0xaf050403	THERMALSERVICES	System Overheat Warning	"System Overheat Warning: Finish exam and shutdown."	Continue
0xaf050405	THERMALSERVICES	Battery Overheat Warning	"Battery Overheat Warning: finish exam - replace battery."	Continue
0xaf050430	THERMALSERVICES	PWR_HV over warning Temperature Limit	"System Overheat Warning: Finish exam and shutdown."	Continue
0xaf050431	THERMALSERVICES	PWR_LV over warning Temperature Limit	"System Overheat Warning: Finish exam and shutdown."	Continue
0xaf050432	THERMALSERVICES	PWR_TSUPR over warning Temperature Limit	"System Overheat Warning: Finish exam and shutdown."	Continue
0xaf050433	THERMALSERVICES	DIG_HYDRA over warning Temperature Limit	"System Overheat Warning: Finish exam and shutdown."	Continue
0xaf050434	THERMALSERVICES	DIG_VSUPR over warning Temperature Limit	"System Overheat Warning: Finish exam and shutdown."	Continue

Error Code	Subsystem	Message for Error log	User Error Message	Action on Action
0xaf050435	THERMALSER VICES	XMT_V5NA over warning Temperature Limit	"System Overheat Warning: Finish exam and shutdown."	Continue
0xaf050436	THERMALSER VICES	XMT_VSUPR over warning Temperature Limit	"System Overheat Warning: Finish exam and shutdown."	Continue
0xaf050438	THERMALSER VICES	RCV_AFE over warning Temperature Limit	"System Overheat Warning: Finish exam and shutdown."	Continue
0xaf050439	THERMALSER VICES	RCV_CW over warning Temperature Limit	"System Overheat Warning: Finish exam and shutdown."	Continue
0xaf05043a	THERMALSER VICES	RCV_LV over warning Temperature Limit	"System Overheat Warning: Finish exam and shutdown."	Continue
0xaf05043b	THERMALSER VICES	RCV_VSUPR over warning Temperature Limit	"System Overheat Warning: Finish exam and shutdown."	Continue
0xaf05043c	THERMALSER VICES	Multiple Sensors over warning Temperature Limit	"System Overheat Warning: Finish exam and shutdown."	Continue
0xaf0f0404	ACQCONTRO L	MPP can't connect	"MTP can't connect. Please disconnect and reconnect."	Continue
0xaf0f0405	ACQCONTRO L	MPP can't connect. Voltage Error	"MTP can't connect. Please disconnect and reconnect."	Continue
0xaf0f0407	ACQCONTRO L	CWBoard Current or Voltage Error	"CW Error. Please disconnect and reconnect MTP."	Continue
0xe000401	SYSTEM_SER VICES_EVA	Watchdog Server: Task Not Responding	"Internal System Error has occurred. "	Restart
0xe0004005	UNKNOWN	Failed to configure FPGAs);	"Internal System Error has occurred. "	Restart
0xe0004005	UNKNOWN	Fatal Error due to NVASSERT. See above NVASSERT log statement for details	"Internal System Error has occurred. "	Restart
0xe00a0401	IMAGING	PIC is Invalid, No HV support	"Internal System Error has occurred. "	Restart
0xe00a0403	IMAGING	HV's not the same when attempting dynamic update of limits	"Internal System Error has occurred. "	Restart
0xe00a0404	IMAGING	Failed to reset the PIC HV task	"Internal System Error has occurred. "	Restart

Error Code	Subsystem	Message for Error log	User Error Message	Action on Action
0xe00a0405	IMAGING	Failed to set HV limits to PIC	"Internal System Error has occurred. "	Restart
0xe00a0406	IMAGING	Failed to set QDAC voltage to target	"Internal System Error has occurred. "	Restart
0xe00a0408	IMAGING	Can't Read voltage from PIC	"Internal System Error has occurred. "	Restart
0xe00a0409	IMAGING	High Voltage not dumped prior to power up	"Internal System Error has occurred. "	Restart
0xe00a040a	IMAGING	VBoost error	"Internal System Error has occurred. "	Restart
0xe00a040b	IMAGING	PFE HW Fault Error	"Internal System Error has occurred. "	Restart
0xe00a040c	IMAGING	PIC version is invalid, No HV support	"Internal System Error has occurred. "	Restart
0xe00a040e	IMAGING	HV Fault	"Internal System Error has occurred. "	Restart
0xe00a040f	IMAGING	HV Fault	"Internal System Error has occurred. "	Restart
0xe00a0410	IMAGING	HV Fault	"Internal System Error has occurred. "	Restart
0xe00a0411	IMAGING	HV Fault	"Internal System Error has occurred. "	Restart
0xe00a0412	IMAGING	HV Fault	"Internal System Error has occurred. "	Restart
0xe00a0413	IMAGING	HV Fault	"Internal System Error has occurred. "	Restart
0xe00a0414	IMAGING	HV Fault	"Internal System Error has occurred. "	Restart
0xe00a0415	IMAGING	HV Fault - can't identify	"Internal System Error has occurred. "	Restart
0xe00a0420	IMAGING	Power Micro Driver failed to disable HV	"Internal System Error has occurred. "	Restart
0xe00a0421	IMAGING	Power Micro Driver failed to send Set HV message	"Internal System Error has occurred. "	Restart
0xe00a0422	IMAGING	HV1N Not in limits	"Internal System Error has occurred. "	Restart
0xe00a0423	IMAGING	HV1P Not in limits	"Internal System Error has occurred. "	Restart
0xe00a0424	IMAGING	HV2N Not in limits	"Internal System Error has occurred. "	Restart
0xe00a0425	IMAGING	HV2P Not in limits	"Internal System Error has occurred. "	Restart

Error Code	Subsystem	Message for Error log	User Error Message	Action on Action
0xe00a0426	IMAGING	HV0N Not in limits	"Internal System Error has occurred. "	Restart
0xe00a0427	IMAGING	HV0P Not in limits	"Internal System Error has occurred. "	Restart
0xe00a0428	IMAGING	HVCW Not in limits	"Internal System Error has occurred. "	Restart
0xe00a0429	IMAGING	HVPWR Not in limits	"Internal System Error has occurred. "	Restart
0xe00a042a	IMAGING	Multiple HV's Not in limits	"Internal System Error has occurred. "	Restart
0xe00a042b	IMAGING	EN_HV Inactive	"Internal System Error has occurred. "	Restart
0xe00a042c	IMAGING	PWR_GOOD_HV Inactive	"Internal System Error has occurred. "	Restart
0xe00a042d	IMAGING	LV_FAULT	"Internal System Error has occurred. "	Restart
0xe00a042e	IMAGING	Failed to do CPLD sync	"Internal System Error has occurred. "	Restart
0xe00a042f	IMAGING	HV1N/HV2N/HVCW comparison error (bad command inputs)	"Internal System Error has occurred. "	Restart
0xe00a0430	IMAGING	HV limits check failed (bad command inputs)	"Internal System Error has occurred. "	Restart
0xe00a0431	IMAGING	Failed to set DACs (communication error)	"Internal System Error has occurred. "	Restart
0xe00a0432	IMAGING	HV's aren't in regulation	"Internal System Error has occurred. "	Restart
0xe00a0433	IMAGING	Command not allowed in present state	"Internal System Error has occurred. "	Restart
0xe00a0434	IMAGING	Command not allowed in error state	"Internal System Error has occurred. "	Restart
0xe00a0435	IMAGING	HV Alert unknown Error	"Internal System Error has occurred. "	Restart
0xe00a0436	IMAGING	Received PFE Fault	"Internal System Error has occurred. "	Restart
0xe00a0437	IMAGING	Check HVInput - invalid Input parameters, see log statement above	"Internal System Error has occurred. "	Restart
0xe00a0439	IMAGING	Timeout out waiting for In Regulation message after setting HV's	"Internal System Error has occurred. "	Restart
0xe00a043a	IMAGING	PowerMicro timed-out waiting for HV in regulation	"Internal System Error has occurred. "	Restart
0xef050402	THERMALSER	Thermal Control Sensor Error	"Thermal Sensor Error:	Shutdown

Error Code	Subsystem	Message for Error log	User Error Message	Action on Action
	VICES		shutting down system."	
0xef050404	THERMALSER VICES	Exceeded maximum system error count	"System Temperature Limit exceeded."	Shutdown
0xef050406	THERMALSER VICES	Battery temperature error	"Battery Temperature Limit Exceeded. Replace battery."	Shutdown
0xef050420	THERMALSER VICES	PWR_HV over Temperature	"System Temperature Limit exceeded."	Shutdown
0xef050421	THERMALSER VICES	PWR_LV over Temperature	"System Temperature Limit exceeded."	Shutdown
0xef050422	THERMALSER VICES	PWR_TSUPR over Temperature	"System Temperature Limit exceeded."	Shutdown
0xef050423	THERMALSER VICES	DIG_HYDRA over Temperature	"System Temperature Limit exceeded."	Shutdown
0xef050424	THERMALSER VICES	DIG_VSUPR over Temperature	"System Temperature Limit exceeded."	Shutdown
0xef050425	THERMALSER VICES	XMT_V5NA over Temperature	"System Temperature Limit exceeded."	Shutdown
0xef050426	THERMALSER VICES	XMT_VSUPR over Temperature	"System Temperature Limit exceeded."	Shutdown
0xef050427	THERMALSER VICES	RCV_ZIP over Temperature	"System Temperature Limit exceeded."	Shutdown
0xef050428	THERMALSER VICES	RCV_AFE over Temperature	"System Temperature Limit exceeded."	Shutdown
0xef050429	THERMALSER VICES	RCV_CW over Temperature	"System Temperature Limit exceeded."	Shutdown
0xef05042a	THERMALSER VICES	RCV_LV over Temperature	"System Temperature Limit exceeded."	Shutdown
0xef05042b	THERMALSER VICES	RCV_VSUPR2 over Temperature	"System Temperature Limit exceeded."	Shutdown
0xef05042c	THERMALSER	Multiple Sensors over Temperature	"System Temperature Limit exceeded."	Shutdown

Error Code	Subsystem	Message for Error log	User Error Message	Action on Action
	VICES			
0xef05043d	THERMALSER VICES	Received Temp Alert with unknown error	"System Temperature Limit exceeded."	Shutdown
0xef050440	THERMALSER VICES	Failed to Set Temperature Limits	"Temperature Limit Failure."	Shutdown
0xef050450	THERMALSER VICES	PWR_HV Temperature Sensor Error	"System Temperature Sensor Failure."	Shutdown
0xef050451	THERMALSER VICES	PWR_LV Temperature Sensor Error	"System Temperature Sensor Failure."	Shutdown
0xef050453	THERMALSER VICES	PWR_TSUPR Temperature Sensor Error	"System Temperature Sensor Failure."	Shutdown
0xef050453	THERMALSER VICES	DIG_HYDRA Temperature Sensor Error	"System Temperature Sensor Failure."	Shutdown
0xef050454	THERMALSER VICES	DIG_VSUPR Temperature Sensor Error	"System Temperature Sensor Failure."	Shutdown
0xef050455	THERMALSER VICES	XMT_V5NA Temperature Sensor Error	"System Temperature Sensor Failure."	Shutdown
0xef050456	THERMALSER VICES	XMT_VSUPR Temperature Sensor Error	"System Temperature Sensor Failure."	Shutdown
0xef050457	THERMALSER VICES	RCV_ZIP Temperature Sensor Error	"System Temperature Sensor Failure."	Shutdown
0xef050458	THERMALSER VICES	RCV_AFE Temperature Sensor Error	"System Temperature Sensor Failure."	Shutdown
0xef050459	THERMALSER VICES	RCV_CW Temperature Sensor Error	"System Temperature Sensor Failure."	Shutdown
0xef05045a	THERMALSER VICES	RCV_LV Temperature Sensor Error	"System Temperature Sensor Failure."	Shutdown
0xef05045b	THERMALSER VICES	RCV_VSUPR2 Temperature Sensor Error	"System Temperature Sensor Failure."	Shutdown
0xef050460	THERMALSER	PWR_HV sensor communication error	"System Temperature Sensor Communication Error."	Shutdown

Error Code	Subsystem	Message for Error log	User Error Message	Action on Action
	VICES			
0xef050461	THERMALSER VICES	PWR_LV sensor communication error	"System Temperature Sensor Communication Error."	Shutdown
0xef050462	THERMALSER VICES	PWR_TSUPR sensor communication error	"System Temperature Sensor Communication Error."	Shutdown
0xef050463	THERMALSER VICES	DIG_HYDRA sensor communication error	"System Temperature Sensor Communication Error."	Shutdown
0xef050464	THERMALSER VICES	DIG_VSUPR sensor communication error	"System Temperature Sensor Communication Error."	Shutdown
0xef050465	THERMALSER VICES	XMT_V5NA sensor communication error	"System Temperature Sensor Communication Error."	Shutdown
0xef050466	THERMALSER VICES	XMT_VSUPR sensor communication error	"System Temperature Sensor Communication Error."	Shutdown
0xef050468	THERMALSER VICES	RCV_AFE sensor communication error	"System Temperature Sensor Communication Error."	Shutdown
0xef050469	THERMALSER VICES	RCV_CW sensor communication error	"System Temperature Sensor Communication Error."	Shutdown
0xef05046a	THERMALSER VICES	RCV_LV sensor communication error	"System Temperature Sensor Communication Error."	Shutdown
0xef05046b	THERMALSER VICES	RCV_VSUPR sensor communication error	"System Temperature Sensor Communication Error."	Shutdown
0xef05046c	THERMALSER VICES	Multiple Temperature Sensor Error	"System Temperature Sensor Failure."	Shutdown
0xef05046d	THERMALSER VICES	Temp Sensor Alert received with unknown error	"System Temperature Sensor Failure."	Shutdown
0xef050470	THERMALSER VICES	Failed read alert status	"Temperature Limit Failure."	Shutdown
0xef050480	THERMALSER VICES	Fan is stuck	"System fan Error: Shutting down."	Shutdown
0xef070401	DISPLAY	DVI configuration failed	"Monitor Configuration Error: Please shutdown	Shutdown

Error Code	Subsystem	Message for Error log	User Error Message	Action on Action
			system."	
0xef080401	FRONT_END_POWER	Low Voltage failure occurred	"Internal System Error has occurred. "	Shutdown
0xef080402	FRONT_END_POWER	Relay Voltage failure occurred	"Internal System Error has occurred. "	Shutdown
0xef080403	FRONT_END_POWER	3.3 Voltage failure occurred	"Internal System Error has occurred. "	Shutdown
0xef080404	FRONT_END_POWER	V5_D Voltage failure occurred	"Internal System Error has occurred. "	Shutdown
0xef0e0401	ROUTER	Video Memory Test Failed	"Internal System Error has occurred. "	Shutdown
0xef0e0402	ROUTER	DCM LOCK Fault has occurred	"Internal System Error has occurred. "	Restart
0xef0f0000	ACQCONTROL	Pipeline Fault Event Occurred	"Internal System Error has occurred. "	Restart
0xef0f0401	ACQCONTROL	Post Power on check indicates faulty power circuit	"Internal System Error has occurred. "	Restart
0xef0f0403	ACQCONTROL	Acq Programming Timeout Expired: Failed to complete programming sequence	"Internal System Error has occurred. "	Restart
0xef0f0406	ACQCONTROL	CW board over temperature	"System Temperature Limit exceeded."	Restart
0xef100404	UCM	Operation Called with invalid iterator	"Internal System Error has occurred. "	Restart
0xef100406	UCM	Shutdown Imaging System	"Internal System Error has occurred. "	Restart
0xef100407	UCM	Freeze: Acquisition Command	"Internal System Error has occurred. "	Restart
0xef100408	UCM	Load Cine Loop	"Internal System Error has occurred. "	Restart
0xef100409	UCM	Play Cine Frame Loop	"Internal System Error has occurred. "	Restart
0xef10040a	UCM	Store Cine Loop	"Internal System Error has occurred. "	Restart
0xef10040b	UCM	Get Image	"Internal System Error has occurred. "	Restart

Error Code	Subsystem	Message for Error log	User Error Message	Action on Action
0xef100410	UCM	Software install failed. Please Re-install the system software	"Software install failed. Please Re-install the system software."	Restart
0xef100412	UCM	Software license expired. Please Re-install the system software.	"Software license expired. Please Re-install the system software."	Restart
0xef100412	UCM	Software license expired. Please Re-install the system software.	"Software license expired. Please Re-install "the system software."	Restart
0xef100413	UCM	Software license not authorized for this release level. Contact system support.	"Software license not authorized for this release level. Contact system support."	Restart
0xef100414	UCM	Installed Software Release does not support cart. Undock Scanner	"Installed Software Release does not support cart. Undock Scanner."	Restart
0xef104005	UCM	Failed to obtain device configuration for DICOM image	"Internal System Error has occurred. "	Restart

Battery Performance – Charge Times - Reconditioning

The following information is intended to provide an overview on the battery-driven system operation times and charging intervals for the Z-PAK battery pack.. There are a number of variables that impact both the operating time and charge time, that must be taken into consideration when anticipating the performance of a specific battery.

Both battery packs are "consumable" items, and as such should be expected to have a gradual drop-off in performance (system operating time) over their life span. The system operating time numbers listed in this document are in reference to a "new" (optimum) battery.

Charging times will be significantly impacted by the temperature of the battery pack at the time of the start of the charging cycle. The intelligent PIC device that manages the charging process will disable, or reduce the rate of charge, as dictated by the battery pack's current temperature.

The total time that will be required for a battery to reach a full state of charge is impacted by a number of variables. These include:

- 1) Operating state of system (transducer in use: HV active)
- 2) Temperature of battery pack
- 3) Initial first-charge for Z-PAK:

Cart Battery Pack

Performance:

Typical system operation interval (on full charge):..... **up to 1.5 Hours**

Charging:

Fast Charge Rate (5A): **5.0 hours** (total)
Step #1:..... **3.0 hours** – main charge
Step #2:..... **2.0 hours** – final top-off charge
Trickle-Charge Rate (i.e., hot battery state)..... **16.0 Hours** (worst-case)

Recondition & Full Charge State:

Optimum (battery in cool state, and initial charge level near full) **8.0 Hours** (total)
Step #1:..... **0 to 5 hours** - to charge to full
Step #2:..... **2-3 hours** - to fully discharge
Step #3:..... **4-6 hours** - to fully recharge

Worst-case (battery in hot state, and initial charge level near zero) **13.0 Hours**

17 REPLACEMENT PROCEDURES

The procedures described in this section of the Service Manual should be performed ONLY by a ZONARE trained service personnel (Service Engineer, Biomed, etc.).

Recommended Tools

Tool Description	Size	Qty	Where used
Screwdriver, flat blade, medium tip, std. length	3mm blade, 6" shaft, std. thick	1	General use
Screwdriver, Phillips, large tip, std length	#3, 6" shaft	1	Power supply module
Screwdriver, Phillips, med. tip std length	#2, 6" shaft	1	General Assembly
Screwdriver or Allen Wrench	4mm, 6" shaft	1	Power supply module, Dock, Zpak
Pliers, Diagonal Cutters, small	Small jaws	1	General cutting of tie wraps, etc.
Nut-Driver Set (U.S.)	Multi-sizes	1 set	Display
Socket Wrench Set, (10mm, 13mm)	Multi-sizes	1 set	Gas spring (13mm)
Allen Wrench Set (Metric)	2.5mm, 5mm 4mm	1	Gas spring Dock, ZPAK and Pwer Module
Flashlight, Mini-Mag	6" size	1	Illuminating tight access areas
Magnetic pick-up tool	Telescoping	1	Retrieval of hardware

z.one_{pro} Module – Removal/Replacement

Identify the process for replacing the z.one_{pro} Module.

Overview of Procedure:

- Remove Cosmetic Cover
- Remove z.one_{pro} Module
- Replace z.one_{pro} Module
- Reassemble Cosmetic Cover
- Verification of System

Parts Required:

- **88001-00 Module**

Equipment / Tools Required:

- **No Tools Required**

Open Chassis Cosmetics:

1. Ensure the system is powered “OFF”.
2. Place AC circuit breaker, located at the rear of the cart, in the “OFF” position.



3. Disconnect the main AC power cord from the rear of the cart or unplug from the wall source.
4. Ensure the cart wheels are in the locked position.
5. Wrap fingers under both bottom corners of plastic covering and pull until the covering is removed.



Remove z.one_{pro} Module:

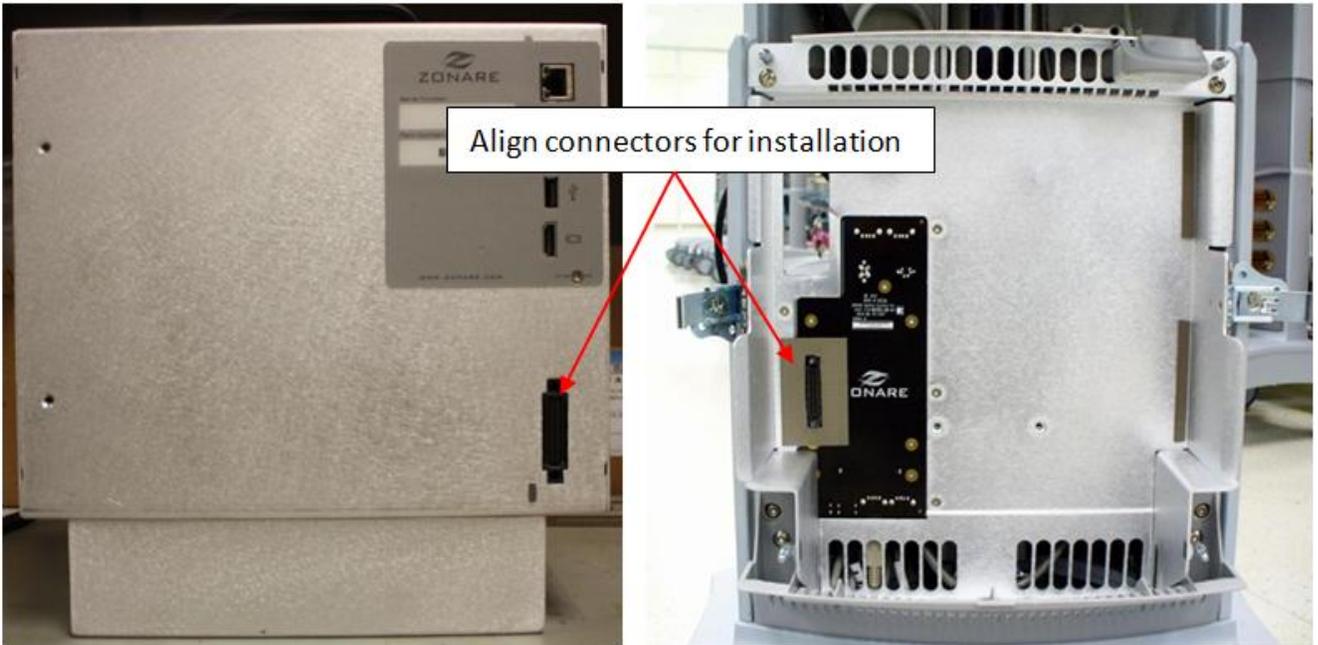
1. Flip open metal flaps on either side of the chassis.
2. Turn each flap counterclockwise $\frac{1}{4}$ turn so that each clasp is released. Move each clasp out of the slots on the sides of the chassis.
3. While holding the handles on the top and bottom of the Module, pull until the module is removed completely.

Note: Place Module with transducer ports up on a clean, dry surface.



Replace z.one_{pro} Module:

1. Align replacement z.one_{pro} Module so that narrow end is on the bottom and top surface is below the convex plastic tab.



2. Push z.one_{pro} Module into place.
3. Insert the clasps into the slots and tighten by turning the flaps clockwise.
4. Fold the flaps so that they are parallel to the sides of the z.one_{pro} Module



Reassemble Cosmetics:

1. Align plastic covering so that transducer slots are aligned with transducer ports. Attach the top portion first snapping into the ball studs in each corner.



2. Proceed to push the bottom half of the module cover in place by using thumbs to press on indented thumb tabs at bottom and push in until cover snaps in place

Verification of System:

1. Reconnect the main AC power cord from the rear of the cart or plug into the wall source.
2. Place AC circuit breaker, located at the rear of the cart, in the “ON” position.



3. Ensure the system is docked.
4. Energize the system.
5. Attach a transducer (if not already connected)
6. Verify that the system is functioning correctly by performing a basic test. This test is comprised of the following:
 7. Verify LCD display is functioning correctly by watching the boot and verifying that normal imaging is displayed after fully booted.
 8. Verify audio from the Display Assy – Enter PW, turn up the PW Gain and increase Volume.
 9. Verify that the User Interface keys are functioning correctly.
 10. Test USB ports on Main Board panel.
 11. Test and Verify Network Connectivity (if applicable).
 12. Test and Verify USB Peripheral Connectivity and Functionality (if applicable).
13. Verification is complete – return system to normal operation.

17" Display – Removal/Replacement

Required Parts

- 89051-00 Display Assy, z.one_{pro}

Overview of Procedure

- Removal of Display Assy
- Installation of Display Assy
- Verification of LCD Display & Speakers

Required Tools/Equipment

- #1 Phillips Screwdriver

Removal Procedure

1. Ensure the system is powered “OFF”.
2. Place AC circuit breaker, located at the rear of the system, in the “0” (OFF) position (see Figure 19).



Figure 15: System Circuit Breaker

3. Disconnect the main AC power cord from the rear of the system, or unplug from the wall source.
4. Remove the two (2) Phillips-head screws that are retaining the plastic display panel and remove (see Figure 20 & 21). This will expose the mounting brackets and cables

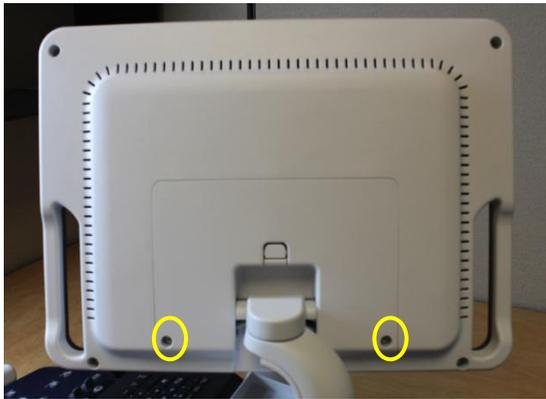
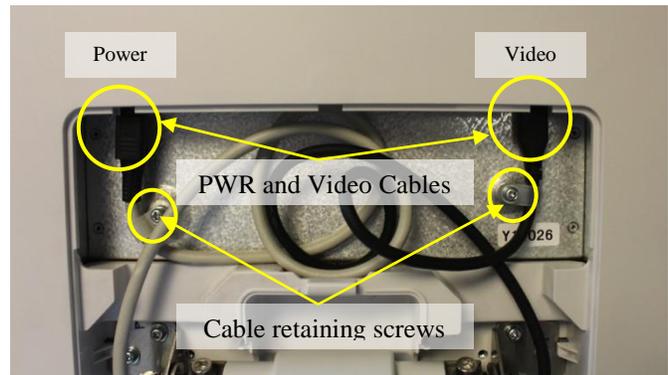


Figure 16: Display Cover

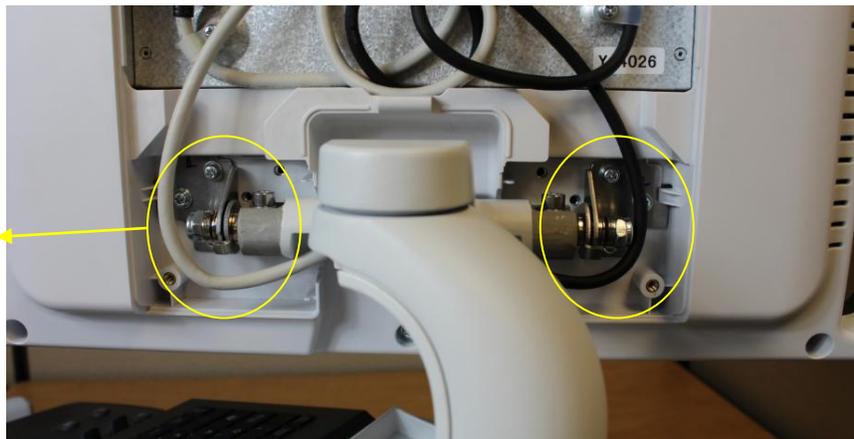
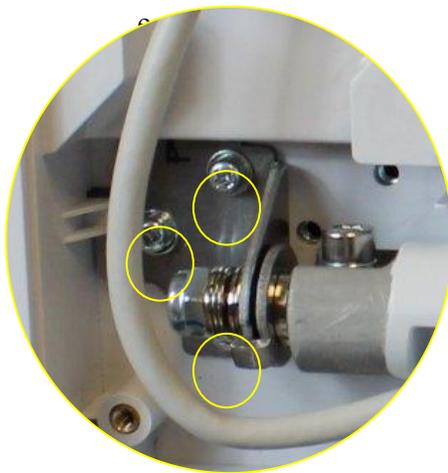


Figure 21: Display Cover removed

5. Remove the screws holding the cable retainers in place.
Note: these retainers are not the same size. Power is slightly larger.
6. Disconnect the two cables by pulling down. (see below)
Note: the power cable (left) has a locking connector which will have to be pulled back slightly to release.



7. Remove the six (6) screws attaching the display to the hinge assembly (three

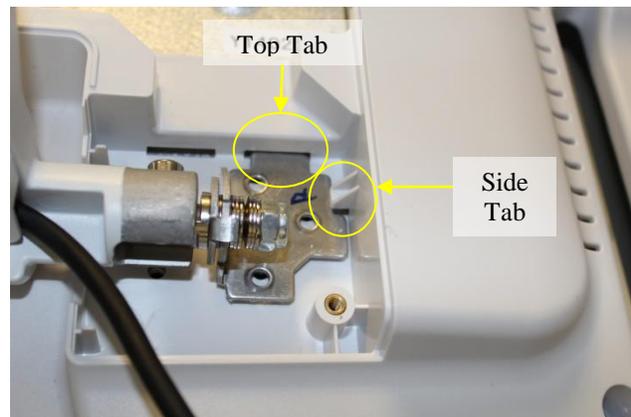
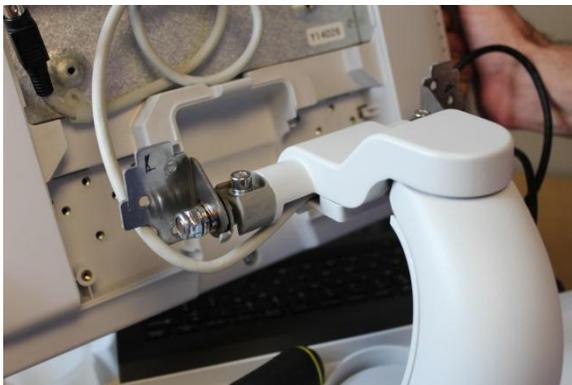




8. The display will drop slightly onto the brackets. There is a tab on each bracket that fits into the slot in the monitor to keep the display from falling. Carefully remove the monitor (see above)
9. Set the display aside.

Installation:

1. Carefully place the display on the hinge brackets shown below. Each bracket top tab should fit in the slot in the monitor. The side tab will fit behind the retaining plastic on the monitor.



2. Install the six (6) screws attaching the display to the hinge assembly (three each side).
3. Reinstall the power and video cables.
4. Reinstall the cable retainers. (*note power retainer slightly larger*).

System Verification:

1. Reconnect the main AC power cord from the rear of the system or plug into the wall source.
2. Place AC circuit breaker, located at the rear of the system, in the “1” (On) position.



3. Ensure the system is docked in the cart.
 4. Energize the system.
 5. Verify that the LCD display is functioning correctly by watching the boot and verifying that normal imaging is displayed after fully booted.
 6. Attach a transducer (if not already connected) and enable PW mode.
 7. Turn PW Gain up to obtain a filled in spectral trace with excess noise (this will generate white noise for the speakers).
 8. Turn the Volume up (Clockwise) and verify that the white noise is audible from both speakers.
 9. If possible – scanning with actual Doppler flow is ideal, but not required.
 10. Verification is complete – return system to normal operation.
-

Cart Battery – Removal/Replacement

Required Parts

- P/N: 85031-00 Assy, Battery Pack, Gen II Cart

Required Tools/Equipment

- #2 Phillips Screwdriver
- 4mm Hex Key

Overview of Procedure

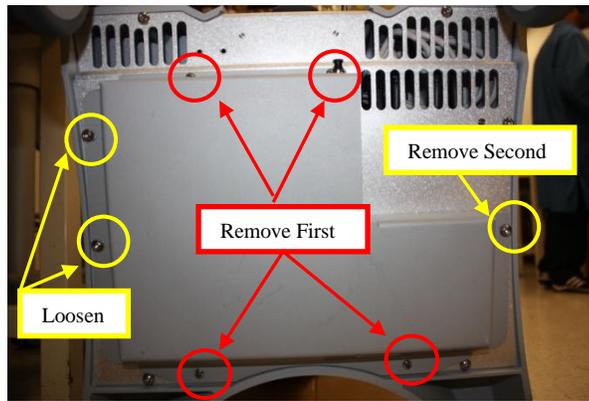
- Removal Battery Pack
- Re-installation of Battery Pack
- Verification of system operation

Battery Pack Removal:

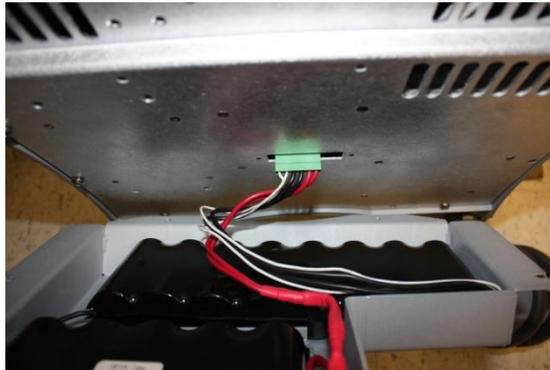
1. Place AC circuit breaker, located at the rear of the system, in the “OFF” position.



2. Disconnect the main AC power cord from the rear of the system.
3. Put the User Interface in the highest position.
4. Set the front caster brakes to prevent system from rolling.
5. The Battery Pack is located under the system. Ensure that the display is in horizontal position. For the easiest access, tilt the entire system forward until is in horizontal position, resting on the front-side handles. Rest the front-side handles on foam or cardboard if available.
6. Remove the four (4) Phillips-head screws that are retaining the Battery Pack to the bottom of the system.



7. Remove the larger screw, located on the right side of the mounting of the Battery Pack to the bottom of the system (leaving the last two (2) screws, on the left side of the battery pack, still in place).
8. Slightly loosen (but DO NOT REMOVE) the remaining two (2) large screws (on the left side of the battery pack), while supporting the weight of the battery pack with your hand.
9. While still supporting the weight of the battery pack, slide it to the right to enable the slotted holes in the cover to come free from the last two mounting screws,



10. Lower the battery pack slightly to enable access to the connector at the end of the battery pack power cable, and unplug the connector from the power supply on the system.
11. Remove the battery pack.

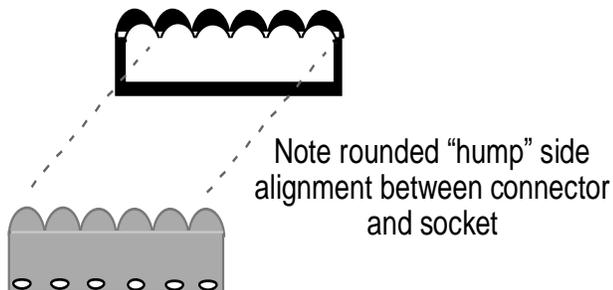


Battery Pack Re-Installation:

1. Insure the main AC power cord to the rear of the system is NOT connected to wall source.
2. While holding the battery pack in position, plug the power connector into the receptacle on the bottom of the power supply.
3. While still supporting the weight of the battery pack attach the power cable to the mating connector on the bottom side of the power supply module on the system.

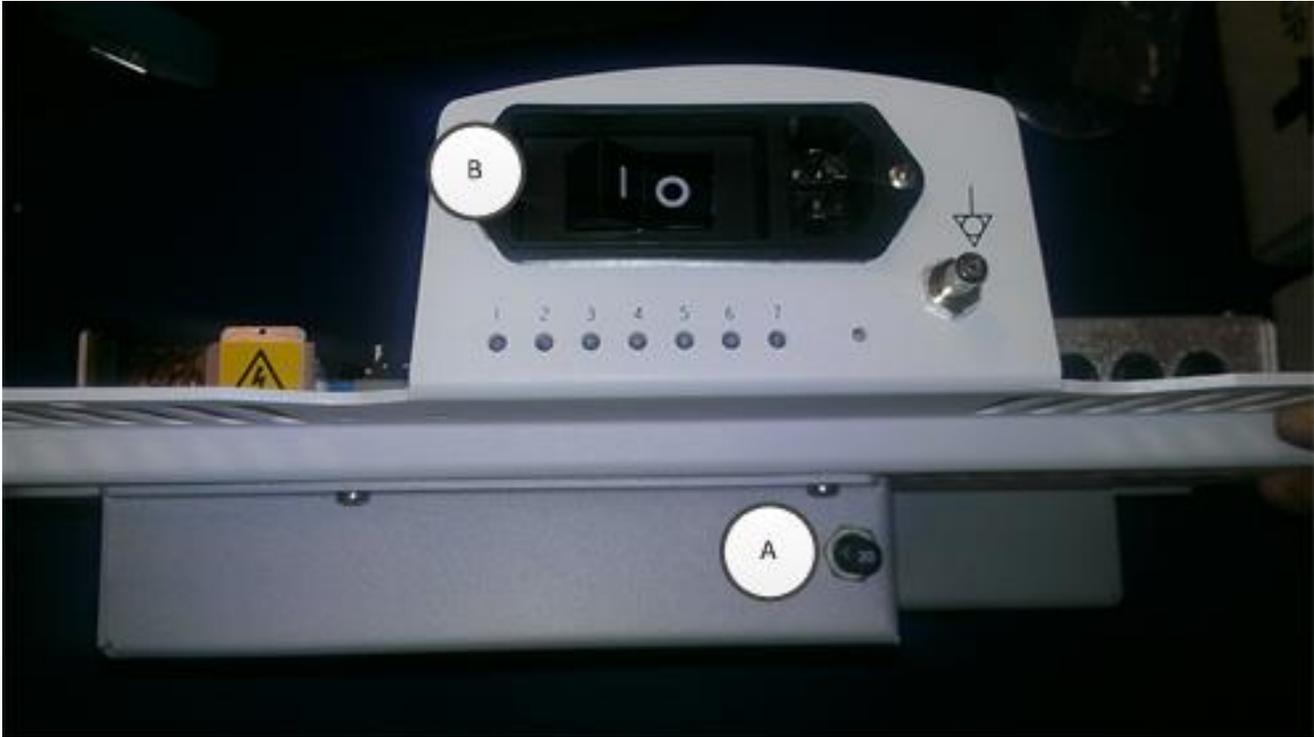


Warning: Be very careful to have the proper connector to socket orientation (note the rounded humps on one side, as shown below) when installing this cable. DO NOT FORCE connection, as this will damage connector and internal electronics.



4. While still supporting the weight of the battery pack, slide the slotted holes in the left side of the cover onto the two (2) loosened mounting screws on the left side of the power supply module.
5. Reinstall all mounting hardware to complete the installation.
6. Before powering on the cart, please engage the two circuit breakers as follows:
 - a. A. Push "**in**" the circuit breaker on the rear of the zpak

- b. B. Flip the cart circuit breaker “on” by pushing in the “1”.



System Verification:

1. Power on the system and perform a series of basic user operations, to verify normal system functionality.
2. Verify that the battery status ICON, on the upper-left corner of the display of the system, shows a current status.
3. Verification is complete – return system to normal operation.

NOTE

Charge until status is “Charged”. This might take 2-16 hours. If not needed for use, power system off but leave plugged in. Once the “Charged” state is reached, LED#2 should now be solid, if not, call Service.

If the Z-PAK battery pack being installed is not a new item (older/reduced capacity cells), or there are any subsequent battery performance concerns after part replacement, perform the “Recondition” procedure described in Chapter 18 of this manual.

Power Module – Removal/Replacement

Required Parts

- P/N: 88012-00 Power Supply Module

Overview of Procedure

- Removal/Replacement of Power Supply Module
- System verification

Required Tools

- 4mm Allen Head Wrench
- #1 Phillips Screwdriver

Procedure

Power Supply Module Removal:

1. Ensure the system is powered “OFF”.
2. Place AC circuit breaker, located at the rear of the system, in the “0” (OFF) position.
3. Disconnect the main AC power cord from the rear of the system or unplug from the wall source.
4. Put the User Interface in the highest position.
5. Set the front caster brakes to prevent system from rolling.
6. Cut any plastic tie-wraps that retain the AC power cable to the chassis, and free it from its mounting for later removal with the Power Supply Module.
7. The Power Supply Module is located under the system. Ensure that the display is in horizontal position. For the easiest access, tilt the system so it rests on the front handles, exposing the bottom of the unit. Rest the front-side handles on foam or cardboard if available.

Remove six (6) of the eight (8) mounting screws as shown below.



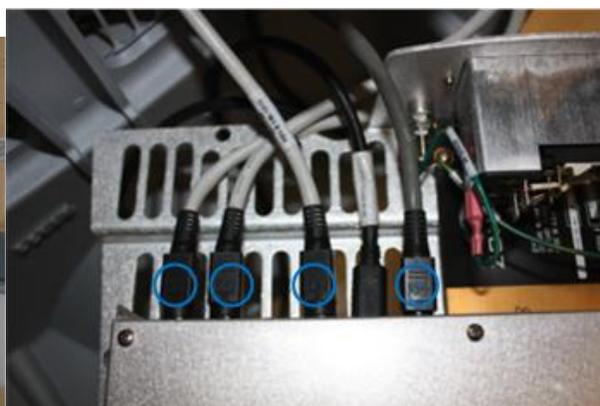
8. Partially remove the lower two (2) mounting screws retaining the power module to the bottom of the system and allow them to help support supply while the cables are being disconnected.



9. Gradually tilt the Power Supply Module approximately 3" to provide access for disconnecting the cabling.



10. Reach in and disconnect the five (5) cable connections. Note where each cable connects for reassembly (see figure for assistance).



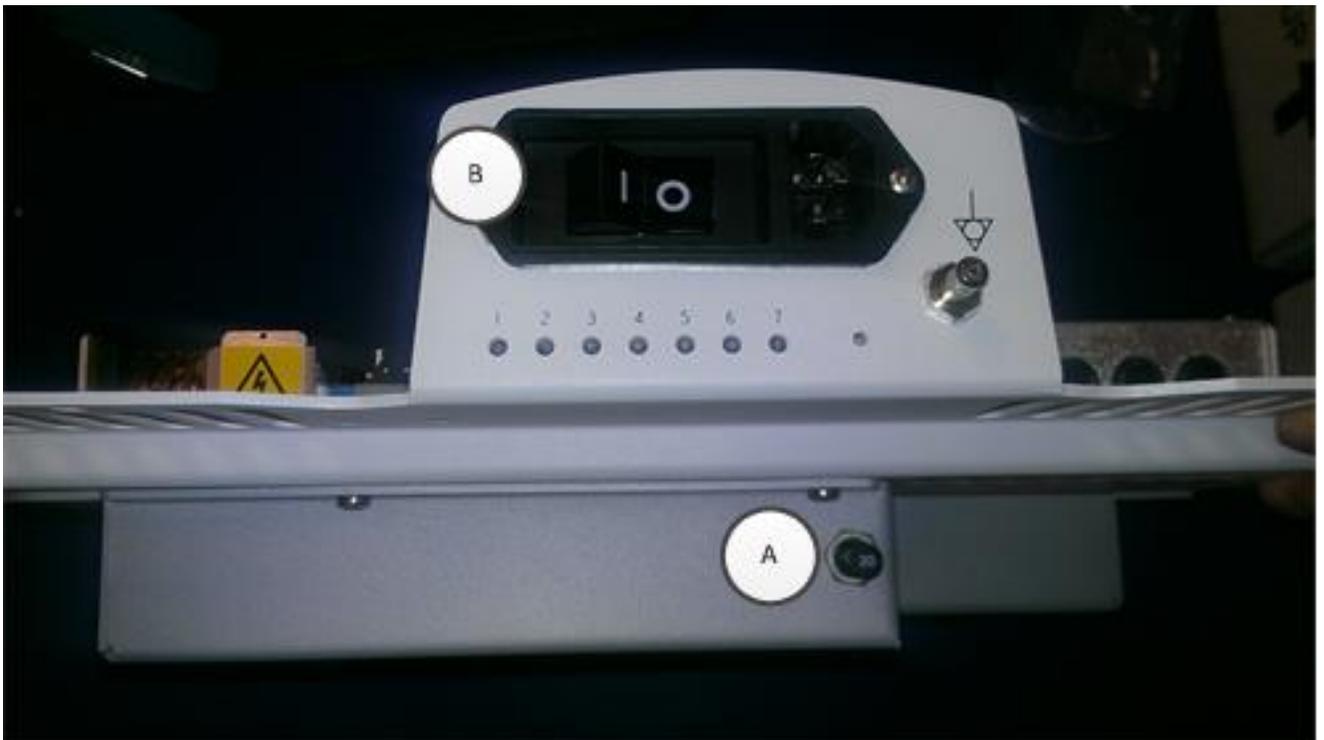
NOTE: The cables marked above have a locking connector. You need to grasp the hood and slide towards you before pulling connector to disconnect.



11. Once the cables are free, set the Power Supply Module aside and prepare for installation.

Installation:

1. Reconnect the cables to the replacement Power Supply Module.
2. Tuck cables back into chassis and position Power Supply Module for installation.
3. Reinstall the eight (8) screws. Ensure that the Power Supply Module is securely connected.
4. Reattach the AC power cord to the socket at the rear of the Power Supply Module.
5. Install battery per instructions if one exists.
6. Before powering on the cart, please engage the two circuit breakers as follows:
 - A. Push “**in**” the circuit breaker on the rear of the zpak
 - B. Flip the cart circuit breaker “**on**” by pushing in the “1”.



7. Tilt system back onto the casters.

System Verification:

1. With the z.one_{pro} Module installed, the LEDs should be as follow:
 - LED 1 will be “on”
 - LED 2 will be blinking
 - LED 3 will blink when battery starts charging.
2. Turn on the system.

3. Verify that the LCD display is functioning correctly by watching the boot and verifying that normal imaging is displayed after fully booted.
4. Attach a transducer (if not already connected) and enable PW mode.
5. Turn PW Gain up to obtain a filled in spectral trace with excess noise (this will generate white noise for the speakers)
6. Turn the Volume up (Clockwise) and verify that the white noise is audible from both speakers.
7. If possible – scanning with actual Doppler flow is ideal, but not required.
8. Go to Service page and click on Maintenance button.
9. Click on Cart Battery Status
10. Verify that the battery is in rapid charge mode.

User Interface – Removal/Replacement

Required Parts

- 86700-00.....Assy, User Interface, z.one_{pro} (Standard Version)
- Or 86702-00.....Assy, User Interface, z.one_{pro} (SP version)
- 86596-00 Trackball Assy (if replaced separately)
- 86597-00 QWERTY, Low profile, (if replaced separately)

Overview of Procedure

- Removal and replacement of User Interface Assy
- System verification

Required Tools/Equipment

- #1 Phillips Screwdriver

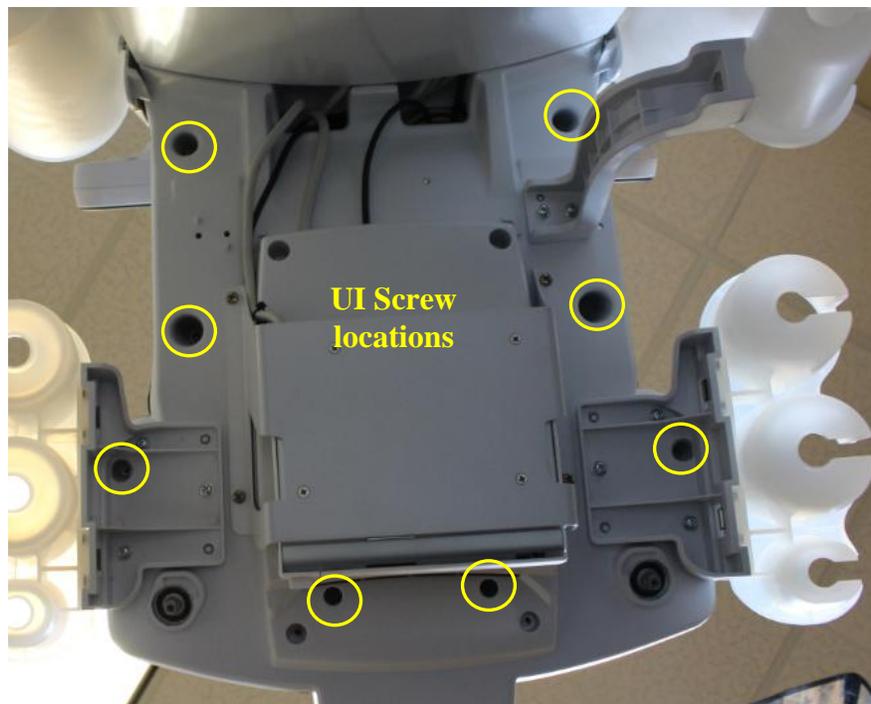
Procedure

UI Removal/Replacement:

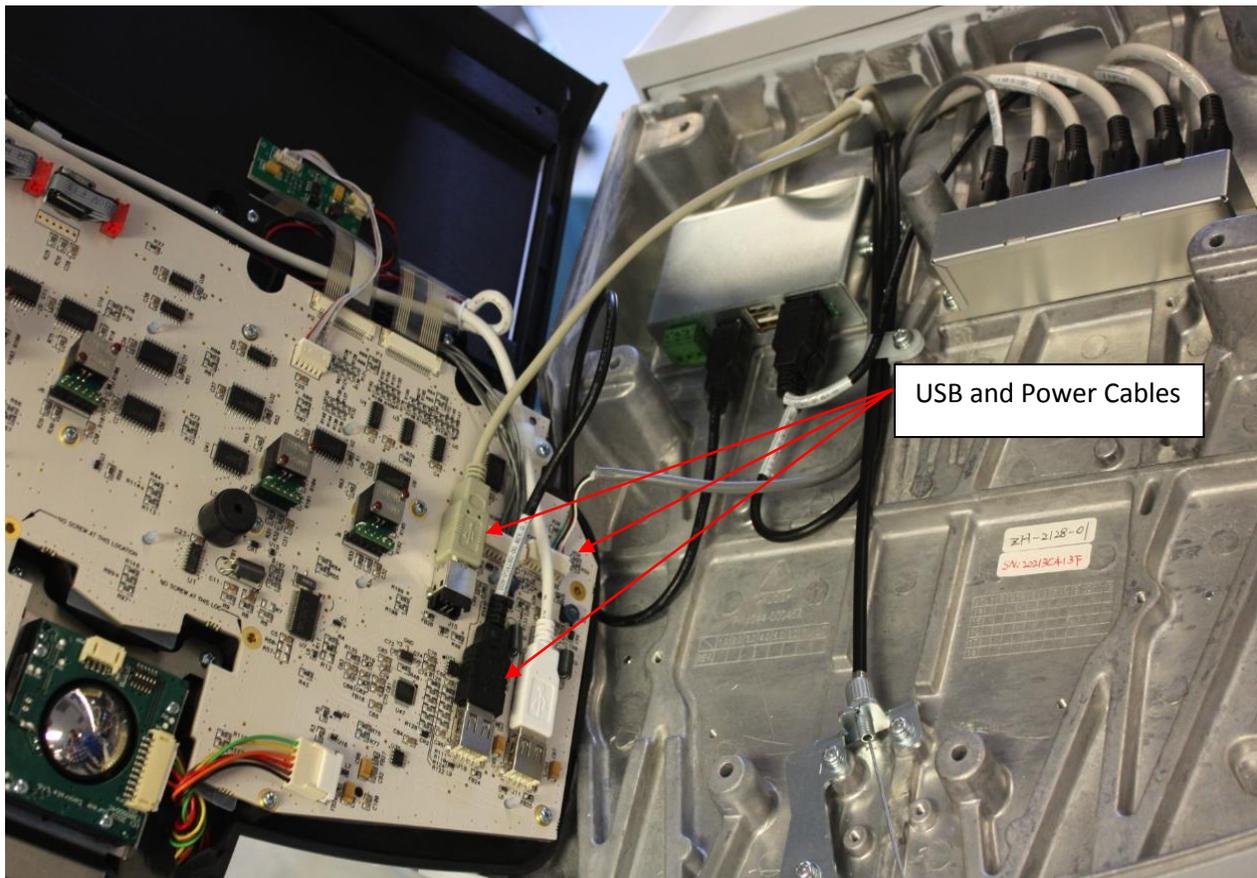
1. Ensure the system is powered “OFF”.
2. Place AC circuit breaker, located at the rear of the system, in the “**0**” (OFF) position.



3. Disconnect the main AC power cord from the rear of the system or unplug from the wall source.
4. Remove the eight (8) Phillips screws that secure the UI to the cast UI base. This will need to be accomplished from below using a Phillips screwdriver.



5. While lifting the User Interface and exposing the underside of the UI, disconnect the USB and power cables from the UI assembly connectors on the bottom side of the User Interface PCB as shown below.



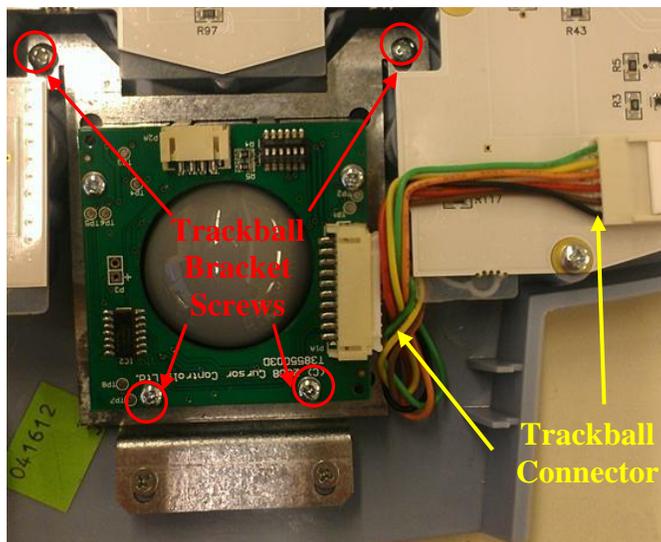
6. Reverse the steps above to install the replacement User Interface.
 - ⇒ If replacement of the trackball is required, proceed to Trackball Replacement steps **prior** to re-installing the User Interface (Refer to section below).
 - ⇒ If replacement of the QWERTY keyboard is required, proceed to QWERTY Replacement steps **prior** to re-installing the User Interface (Refer to section below).

Trackball Removal/Replacement: (if changed separately)

1. Ensure the User Interface is removed per steps 1 thru 5 of User Interface Removal Procedure above.
2. Set the user interface (keys facing down) on a surface that will not damage the surface of the User Interface.

3. Disconnect the trackball from the trackball cable (on the UI side of the cable) and leave the other end connected to the Trackball. Pull the cable free so that the top-right screw is visible. (for connector location - See Figure 3)
4. Remove the four (4) Phillips screws that retain the Trackball (See Figure 3)

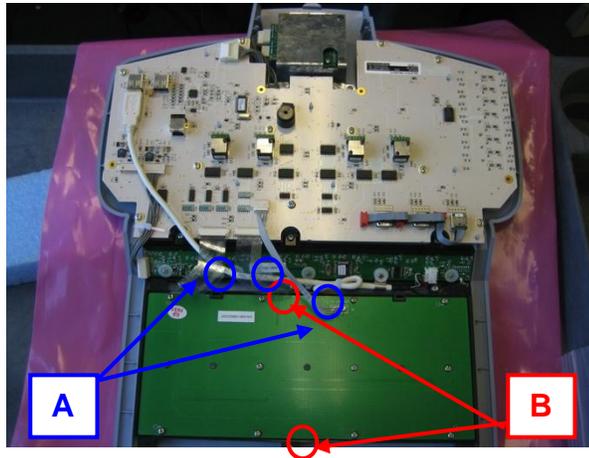
Figure 3



5. Pull the trackball straight up and remove (do not lose the spacers for each of the trackball bracket screws – 4 total)
 6. Reinstall in the reverse order, taking care not to lose the trackball bracket spacers (these can be adhered to the bracket if necessary to ease replacement)
 7. Reinstall the User Interface assembly in reverse order of the removal steps listed above and proceed to System Verification.
-

QWERTY Keyboard Removal/Replacement: (if changed separately)

1. Ensure the User Interface is removed per previous steps of User Interface Removal Procedure above.
2. Set the user interface (keys facing down) on a surface that will not damage the surface of the User Interface.
3. Disconnect the two (2) flex cables and single (1) LED driver cable from the QWERTY assembly (See Locations A).
4. Remove the two (2) Phillips screws that retain the QWERTY assembly (See Location B).



5. Pull the QWERTY straight up and remove.
6. Reinstall in the QWERTY in reverse order.
7. Reinstall the User Interface Assy in reverse order of the removal steps listed above and proceed to System Verification.

System Verification:

1. Reconnect the main AC power cord from the rear of the system or plug into the wall source.
2. Place AC circuit breaker, located at the rear of the system, in the “1” (ON) position.



3. Energize the system.
4. Attach a transducer (if not already connected)
5. Verify that the System is functioning correctly by performing a basic test. This test is comprised of the following:

- Verify that the User Interface keys are functioning correctly by testing each of the keys.
 - Verify that the Softkey OLED displays are correct and functioning correctly based on the selected mode.
 - Verify the trackball functions correctly – testing both the horizontal and vertical axis.
6. Verification is complete – return system to normal operation.
-

OLED Assembly (UI Assy) – Removal/Replacement

Required Parts

- 86901-00..... Assy, OLED2 Display Board

Overview of Procedure

- Removal and re-installation of User Interface Assy
- Replacement of OLED Display Board
- System verification

Required Tools/Equipment

- #1 Phillips Screwdriver

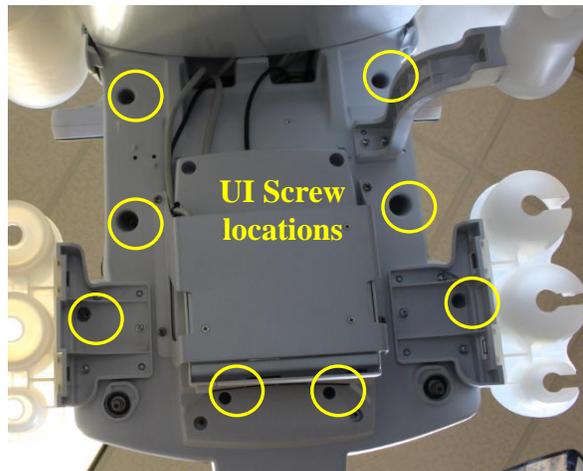
Procedure

UI Removal:

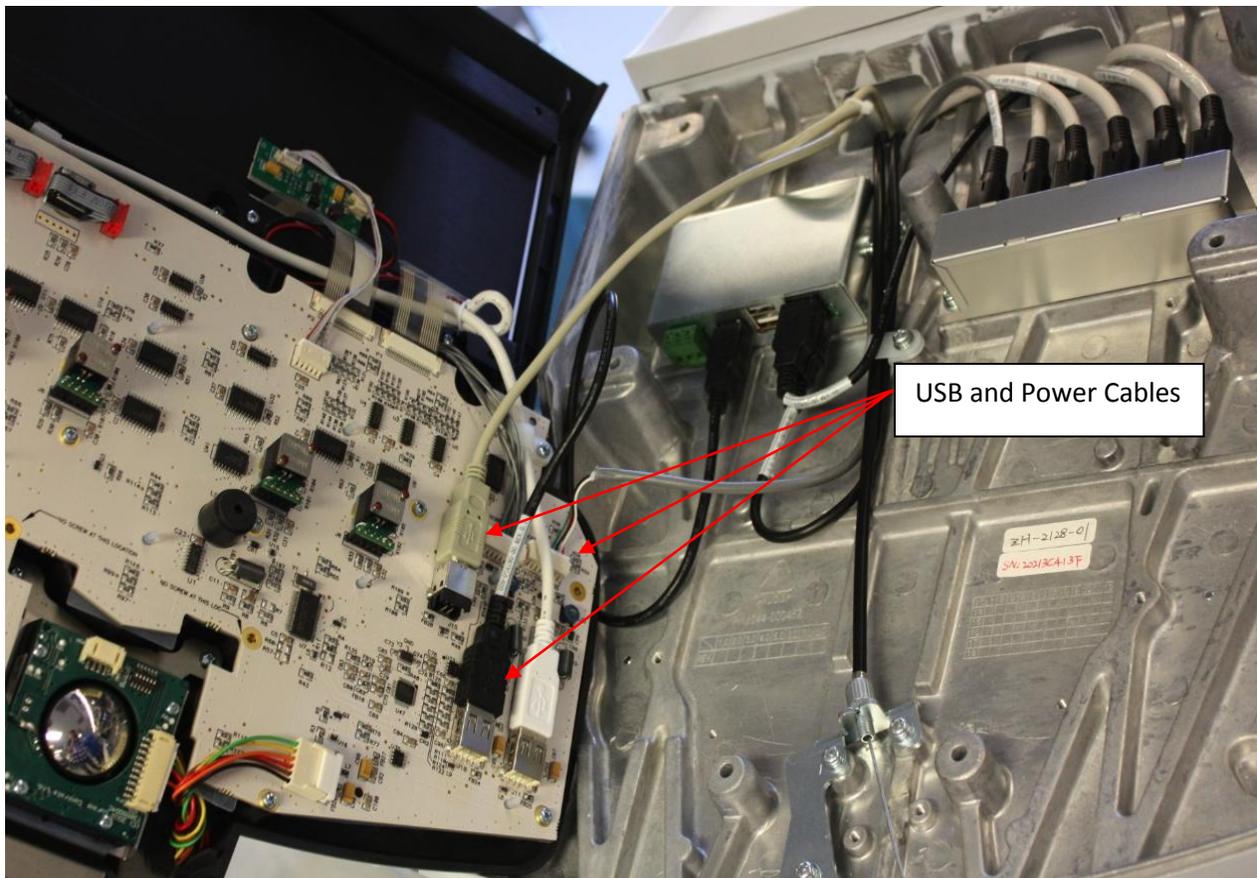
1. Ensure the system is powered “OFF”.
2. Place AC circuit breaker, located at the rear of the system, in the “0” (OFF) position.



3. Disconnect the main AC power cord from the rear of the system or unplug from the wall source.
4. Remove the eight (8) Phillips screws that secure the UI to the cast UI base. This will need to be accomplished from below using a Phillips screwdriver.

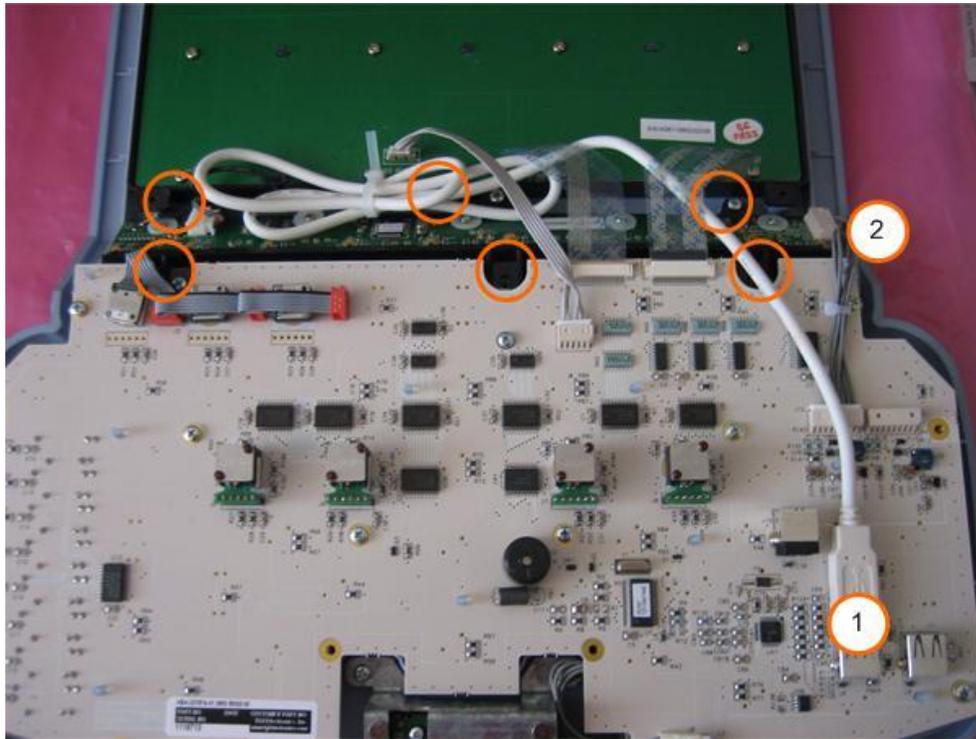


5. While lifting the User Interface and exposing the underside of the UI, disconnect the USB and power cables from the UI assembly connectors on the bottom side of the User Interface PCB as shown below.



OLED Display Board Removal/Replacement:

1. Ensure the User Interface is removed per steps 1 thru 5 of User Interface Removal Procedure above.
2. Set the user interface (keys facing down) on a surface that will not damage the surface of the User Interface.
3. Disconnect the USB cable from the User Interface assembly (location 1, shown below)
4. Disconnect the power cable from the OLED Display Board Assembly (location 2, shown below)
5. Remove the six (6) Phillips screws that retain the OLED assembly



6. Slide the OLED Display Board Assembly out to the left (it is NOT necessary to disconnect the two flex cables going to the QWERTY keyboard, as the OLED assembly can be slid underneath for removal)
7. Reinstall OLED Display Board Assembly in the reverse order. Make sure to connect both cables.
8. Reinstall the User Interface Assy, by executing the earlier steps in reverse order, and proceed to System Verification.

System Verification:

1. Reconnect the main AC power cord from the rear of the system or plug into the wall source.
2. Place AC circuit breaker, located at the rear of the system, in the “1” (ON) position.



3. Energize the system.
 4. Attach a transducer (if not already connected)
 5. Verify that the System is functioning correctly by performing a basic test. This test is comprised of the following:
 6. Verify that the User Interface keys are functioning correctly by testing each of the keys.
 7. Verify that the Softkey OLED displays are correct and functioning correctly based on the selected mode.
 8. Verify the trackball functions correctly – testing both the horizontal and vertical axis.
 9. Verification is complete – return system to normal operation.
-

Dock Module - Removal/Replacement

Required Parts

- P/N: 85019-00 Assy, Dock Module

Required Tools/Equipment

- 4mm Allen Head Wrench
- #1 Phillips Screwdriver

Overview of Procedure

- Remove Module
- Open Cosmetics (for chassis access)
- Remove / Replace Dock Board
- System Verification

General Disassembly:

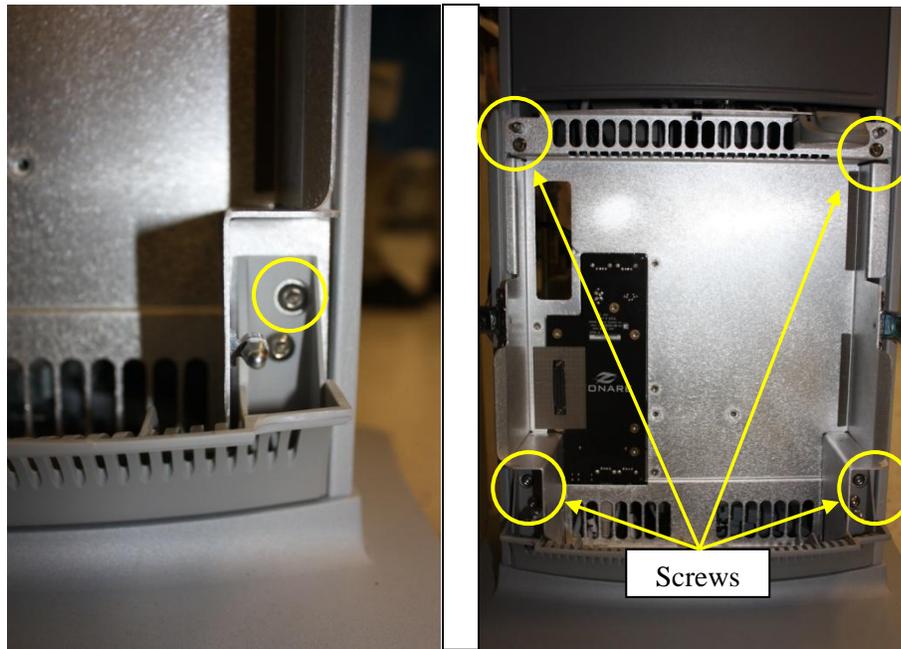
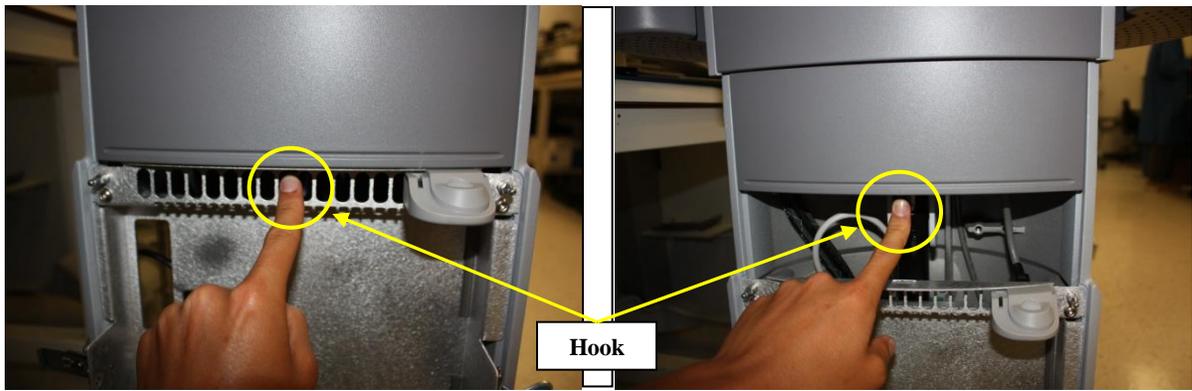
1. Ensure the system is powered “OFF”.
2. Place AC circuit breaker, located at the rear of the system, in the “0” (OFF) position.



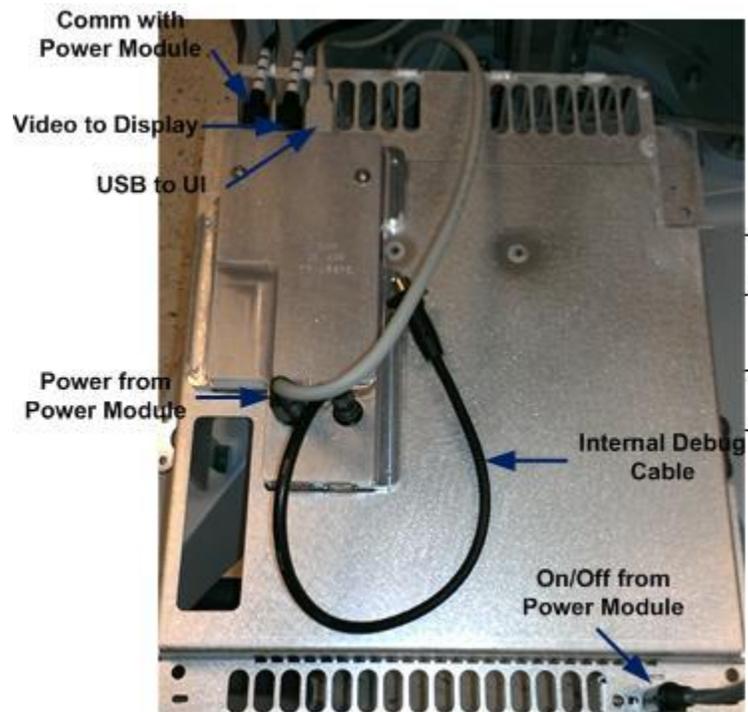
3. Disconnect the main AC power cord from the rear of the system or unplug from the wall source.
4. The plastic covering and z.one_{pro} Module should already be removed.

Note: If the plastic covering and z.one_{pro} Module are not yet removed, see page 154, “z.one_{pro} Module,” to do so.

5. Firmly pushing the hooked connection at the top of the Dock Board towards the back of the cart. Once the hook is free, the plastic cover can slide up.



6. Locate the two screws on each bottom corner of the Dock Board. Unscrew the higher one on each side.
7. Unscrew each of the screws in the top corners of the Dock Board. The Dock Board is now free.
8. Disconnect all wires where they connect to the Dock Board. There are five wires in total. Take note of where each wire connects for reassembly



9. The Dock Board may now be removed completely from the cart
10. Repeat all steps in reverse order to reassemble Dock Board. Reconnect all five wires as they were (See figure above). Replace z.one_{pro} Module and plastic covering.

System Verification:

1. Reconnect the main AC power cord from the rear of the system or plug into the wall source.
2. Place AC circuit breaker, located at the rear of the system, in the “1” (ON) position.



3. Ensure the module is docked and the cosmetic cover is on. LED #1 will blink quickly and LED #5 will remain on.
4. Energize the system

5. Attach a transducer (if not already connected)
 6. Verify that the System is functioning correctly by performing a basic test. This test is comprised of the following:
 - Verify LCD display is functioning correctly by watching the boot and verifying that normal imaging is displayed after fully booted.
 - Verify Audio from the Display Assy – Enter PW, turn up the PW Gain and increase Volume
 - Verify that the User Interface keys are functioning correctly
 - Test USB ports on Main Board panel
 - Test and Verify Network Connectivity (if applicable)
 - Test and Verify USB Peripheral Connectivity and Functionality (if applicable)
 7. Verification is complete – return system to normal operation.
-

Gas Spring – Removal/Replacement

Required Parts

- P/N: 33073-00 Assy, Gas Spring, Gen II Cart

Required Tools/Equipment

- #2 Phillips Screwdriver
- 5mm Allen Hex wrench
- 13mm socket, used on a ratcheting wrench
- 9/32” Nut Driver or wrench

Prerequisite Procedures to Be Performed:

- Main Power Supply Module - Removal

Overview of Procedure

- Removal of gas spring
- Re-installation of above items
- Verification of system operation

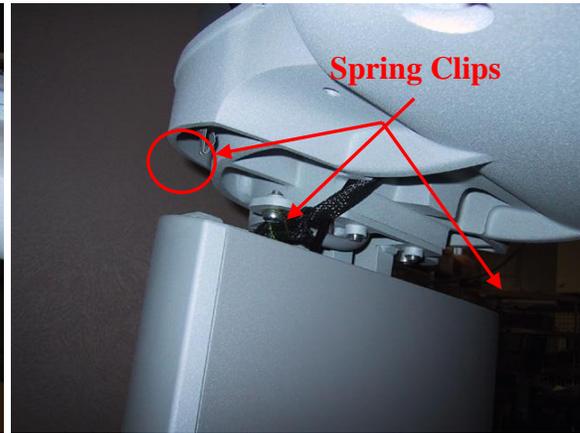
Main Power Supply Removal:

- Perform Main Power Supply Module Removal

(NOTE: Refer to Main Power Supply Replacement Procedure in this manual)

Gas Spring Removal:

1. Using the side of the hand – firmly knock the side of the plastic cosmetic sleeve loose. There are 3 spring clips that retain it at the top. If it does not come free – gently use the flat blade screwdriver to pry the cosmetics loose (use tape on the blade to avoid marring the chassis surface).



2. Slide the plastic cosmetic sleeve downward as far as it will go, letting it slide over the bottom panel insert.



3. Pull the lift release lever and position the User Interface lift to its LOWEST position.
4. Remove the two Phillips-head screws that retain the lower access cover panel.
5. Remove the lower access panel cover by pulling inward on the edges to allow the ridges to clear the frame, and then removing panel.
6. In combination of accessing from the top and through the access holes in the bottom of the chassis, using the 5mm hex Allen wrench and 13mm socket, remove the lower mounting hardware (bolt, nut and 2 spacers) that attaches the gas stock to the base bracket.

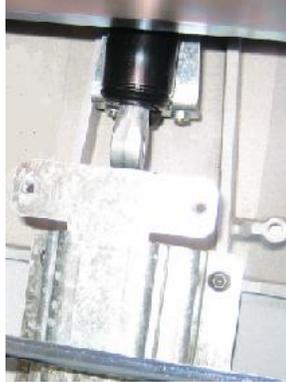


7. Grasp the handles on the User Interface housing, and slide (lift) the upper portion of the system to its most fully extended position to expose (above the top edge of the plastic cosmetic sleeve) the top mounting point for the gas spring.



NOTE: *DO NOT pull the lift release handle while sliding (lifting) the User Interface housing upward, as the bottom gas spring point is currently disconnected, and should raise free of its mounting)*

Raising the User Interface to this position should also allow the bottom of the gas spring to clear (outside) of the attachment bracket.



8. At the top of the gas spring, disconnect the release cable from the actuating mechanism, by first lifting the barrel adjuster out of the mounting slot, and then removing the cable end from its recess in the actuating lever.



9. Remove the upper mounting hardware (bolt, nut and 2 spacers) that attaches the gas stock to the frame of the system.
10. Lift the top portion of the gas spring upward as far as possible, out of the recess channel, and then shift its position to the left as far as possible. The goal being to angle the gas spring for removal via the exit hole on the right-hand hole at the bottom of the base assembly of the system.
11. Reaching through the power supply module cavity in the system, extract the gas spring downward and out through the right-hand access hole.



Gas spring & Power Supply Module Re-Installation:

1. Reverse all of the previous steps for installing the replacement gas spring, and re-installing the power supply module.

System Verification:

1. Reconnect the main AC power cord from the rear of the system or plug into the wall source.
 2. Place AC circuit breaker, located at the rear of the system, in the “**1**” (ON) position.
 3. Operate the lift mechanism through its full range to ensure proper gas spring operation.
 4. Power on the system and perform a series of basic user operations, to verify normal system functionality.
 5. Verification is complete – return system to normal operation.
-

DVD Drive – Removal/Replacement

Required Parts

- P/N 88020-00 Assy, DVD/CD Drive w/Adapter Cable
- P/N 33886-00 Raw, DVD/CD Drive

Required Tools/Equipment

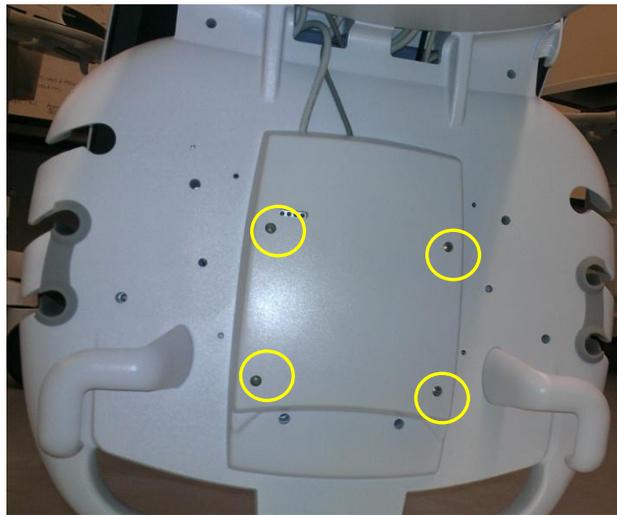
- #2 Phillips Screwdriver
- Small flat blade screwdriver

Overview of Procedure

- Remove and replace DVD Drive
- System Verification

DVD Drive Replacement:

1. Remove the four (4) Phillips-head screws that secure the gray plastic upper-mount brace that retains the DVD drive to the chassis



2. Disconnect the USB and power connections to the DVD Drive.
3. Remove the DVD module from under the metal framework of the system, and remove the drive from the system.
4. Position the replacement DVD drive into its mounting position in the chassis.
5. Connect the USB and power connections to the DVD drive.
6. Secure the DVD drive in place by reinstalling the upper-mount brace, using the four (4) Phillips-head screws.

IMPORTANT NOTE!

ONLY the following two types of media can be used in the DVD drive on the system.

- DVD: DVD “+R” or “+RW” Type (Not - type)
- CD: CD “-R” Type (Not + type)

Reference <http://www.zonare.com/support/accessories/media/> for compatible media

System Verification:

1. Reconnect the main AC power cord from the rear of the system or plug into the wall source.
2. Place AC circuit breaker, located at the rear of the system, in the “1” (ON) position.
3. Press the power button on the system, and allow it to fully boot.
4. Attach a transducer (if not already connected), and ensure basic imaging operation.
5. Insert a blank DVD or CD (*type* as discussed in Note at top of this section) disk (label facing up) into the drive. After 3-4 seconds a green disk icon will appear on the top left corner of the cart display.
6. Go to system archive and export study to the CD. Upon completion, the disk will automatically be ejected.
7. Verification is complete – return system to normal operation.

Transducer TCON Board – Removal/Replacement

Required Parts

- P/N: (as required per transducer type): TCON Board – Pre-programmed

Different TCON board types (part numbers) exist for the full range of ZONARE transducers.

Below is a table specifying TCON board part numbers applicable for each transducer.

Part Number	86466-00 <i>(Pogo-Pin)</i>	86469-00 <i>(Pogo-Pin)</i>	85010-00 <i>(Old Style)</i>
Probe Types (where used)	E9-4 L10-5 L8-3 L14-5sp L20-5 C6-2 C9-3 C9-3sp	C4-1 P4-1c C10-3	L14-5W

Required Tools/Equipment

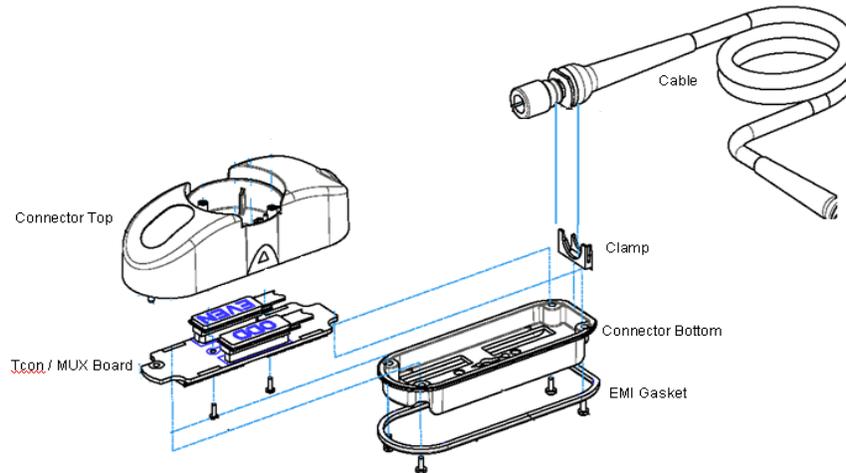
- #3 Tip Phillips-head screwdriver

Overview of Procedure

- Disassemble Connector Housing
- Remove TCON Board and Replace
- Reassemble and Verify Functionality

Connector Disassembly:

1. Remove four Phillips-head screws that retain connector bottom to connector top housing
2. Remove connector bottom from housing
3. Remove two Phillips-head screws that retain T-CON/MUX board to housing
4. Disconnect MUX even and odd connectors from T-CON/MUX board
5. Remove old T-CON/MUX board



T-CON/MUX Board Installation – Connector Re-Assembly:

1. Connect MUX Even and Odd connector to mating sockets on replacement T-CON/MUX board
2. Position T-CON/MUX board over alignment pin and into position for mounting
3. Install two Phillips-head mounting screws, and tighten
4. Position plastic cable clamp into proper orientation (as shown in illustration)
5. Re-install connector bottom to connector top housing, and secure using four Phillips-head screws

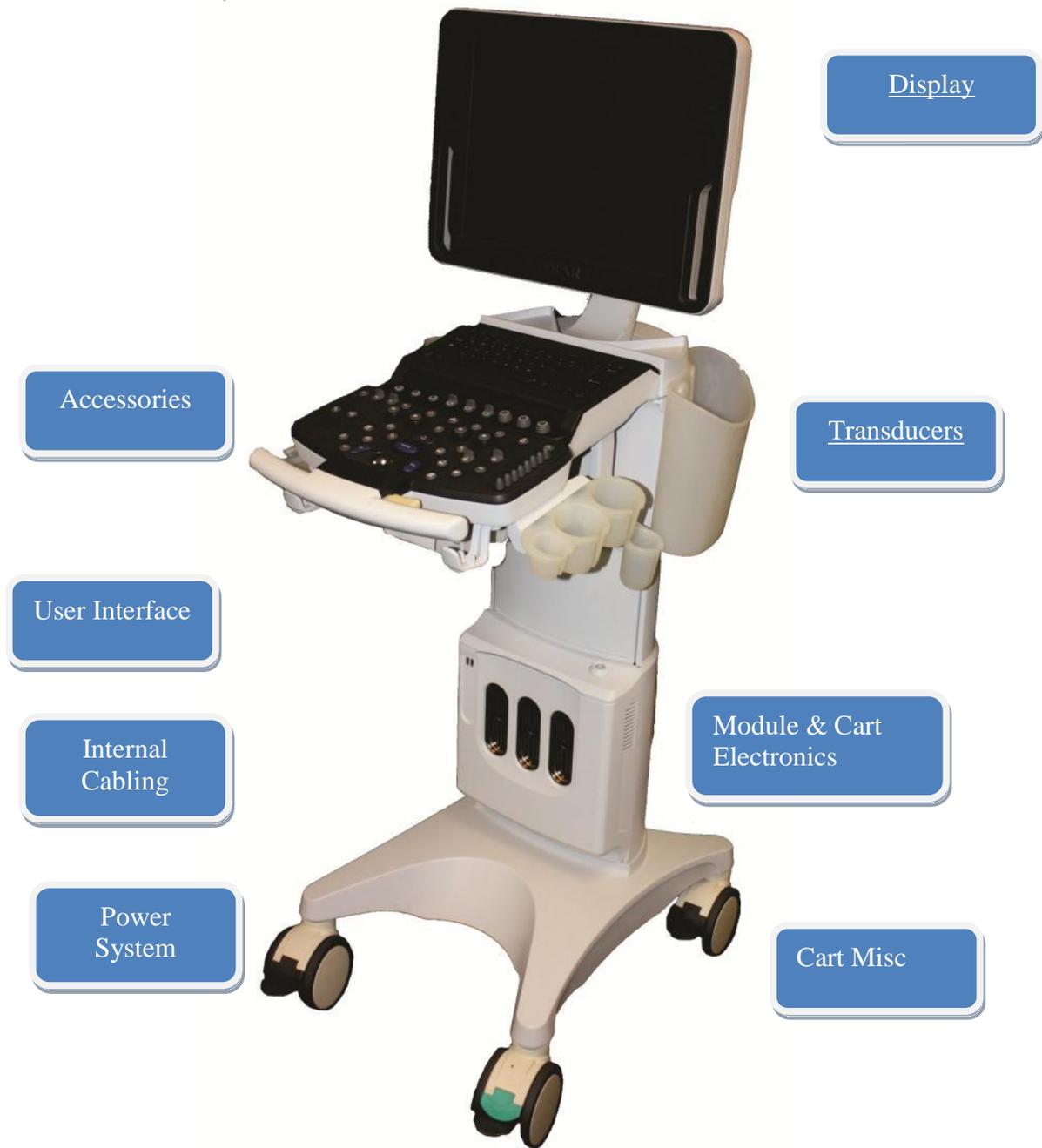


Verification:

1. Attach transducer to system and verify proper operation in all modes

System

Number	Part Number	Description
1	89000-00	z.one _{pro} Ultrasound System

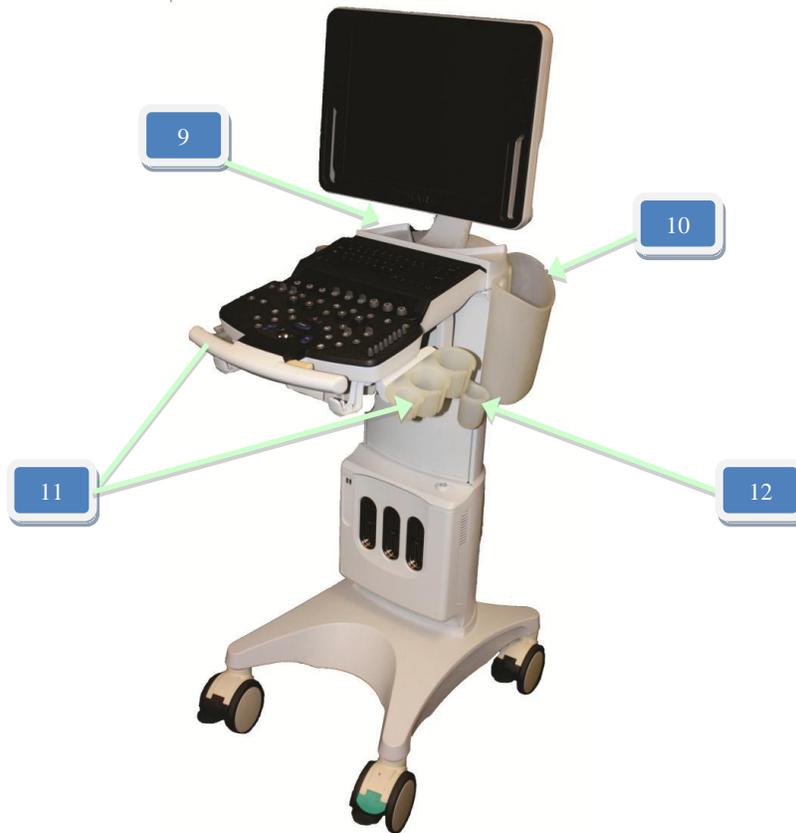


Display



Number	Part Number	Description
3	89051-00	Display, 17", z.one _{pro}
4	89050-00	Display Arm Assembly, z.one _{pro}
5	MR115-02366-00	Overlay Display, z.one _{pro}
6	34311-30	Cable, Power to Display
7	34202-00	Cable, Video to Display

Accessories



Number	Part Number	Description
9	33574-30	Tray
10	33575-30	Saddle Bags (2)
11	89052-00	Left-Right Transducer Holders, z.one _{pro}
12	89053-00	EV Transducer Holder, z.one _{pro}
13	33592-00	Assy, Cable, ECG Patient 3-Lead, AHA
14	33593-00	Assy, Cable, ECG Patient 3-Lead, IEC
15	33524-00	Assy, Cable, ECG Trunk Cable to 3-Lead
16	33525-00	Pads, ECG
17	88036-00	USB Stick

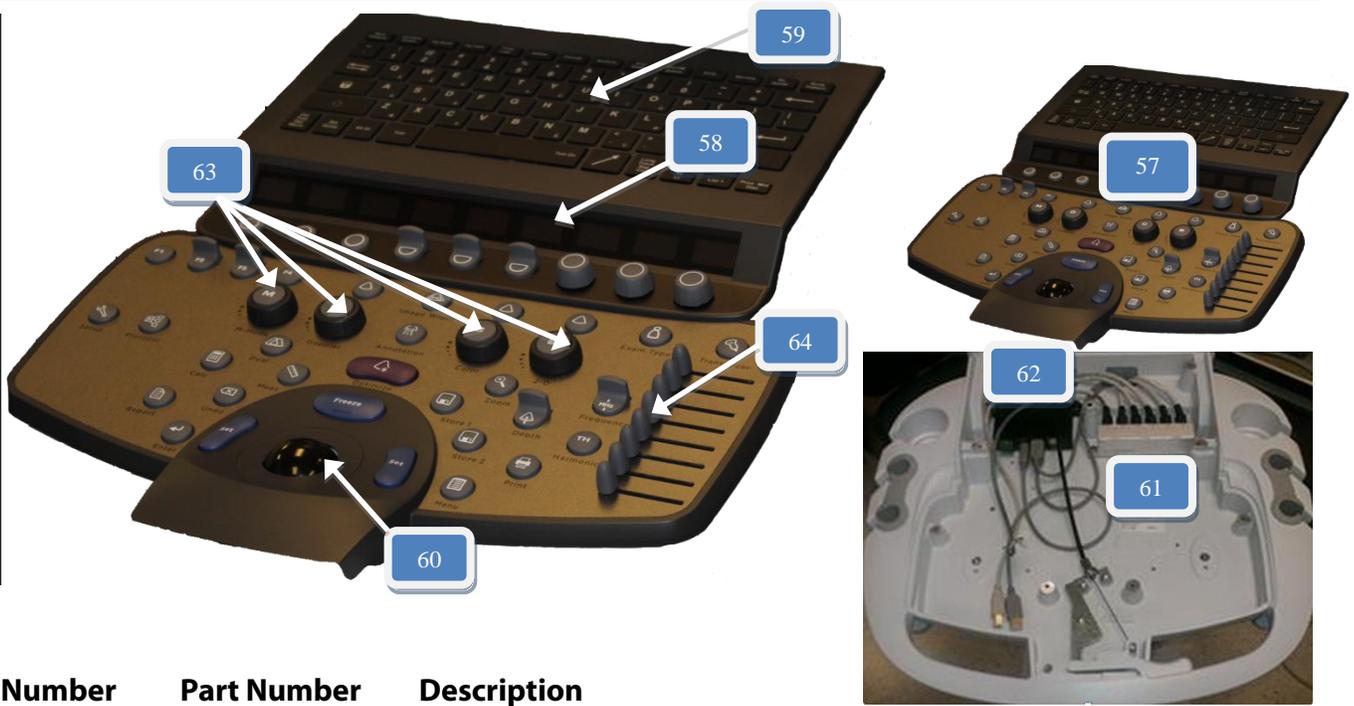
Transducers

Item	Part #	Description	
20	84002-30	E9-4 – Endo Vaginal	
21	84003-30	L10-5 - Linear Array	
22	84004-30	P4-1c - Phased Array	
23	84006-30	P10-4	
24	84007-30	L8-3	
26	84009-30	C6-2	
27	85795-30	C9-3	
28	86333-30	C4-1	
29	85333-30	L14-5W	
33	85888-00	P8-3 TEE - TransEsophageal	
34	86000-00	A2CW – CW Doppler	
35	86111-00	A5CW – CW Doppler	
36	87333-00	C9-3sp	

17.1.1 TRANSDUCER ACCESSORIES

Item	Part #	Description
40	Z150	Biopsy Kit, 16 gauge
41	Z151	Biopsy Kit, 18 gauge
42	Z152	Biopsy Kit, 22 gauge
43	Z153	Biopsy Kit, 16 gauge
44	Z154	Biopsy Kit, 18 gauge
45	Z155	Biopsy Kit, 22 gauge
46	Z156	Biopsy Kit, 16 gauge
47	Z157	Biopsy Kit, 18 gauge
48	Z158	Biopsy Kit, 22 gauge
49	Z159	Biopsy Kit, 16 gauge
50	Z160	Biopsy Kit, 18 gauge
51	Z161	Biopsy Kit, 22 gauge
52	Z162	Biopsy Kit, 16 gauge
53	Z163	Biopsy Kit, 18 gauge
54	Z164	Biopsy Kit, 22 gauge
55	Z165	Biopsy Kit, 16 gauge
56	Z166	Biopsy Kit, 18 gauge

User Interface



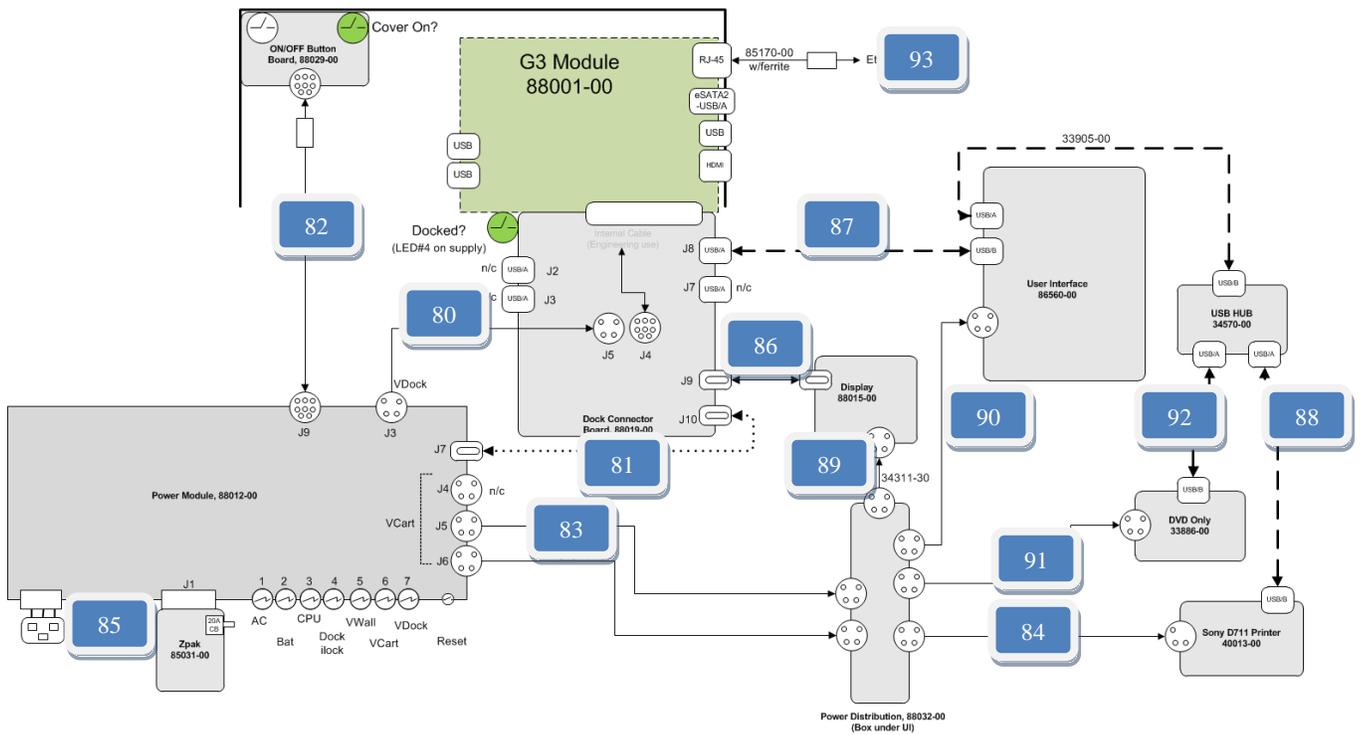
Number	Part Number	Description
57	86700-00	Assy, User Interface, z.one _{pro}
58	86901-00	Assy, OLED2 Board
59	86597-00	Assy, QWERTY Low Profile
60	86596-00	Assy, Trackball Only, z.one _{pro}
61	88032-00	Assy, Power Distribution (under UI)
62	34570-00	USB Hub, z.one _{pro} (under UI)
63	33432-00	Knobs, Outer Mode Key, z.one _{pro}
	33453-00	Knobs, Inner Mode Cap, M-mode, z.one _{pro}
	33454-00	Knobs, Inner Mode Cap, PW-mode, z.one _{pro}
	33455-00	Knobs, Inner Mode Cap, C-mode, z.one _{pro}
	33456-00	Knobs, Inner Mode Cap, B-mode, z.one _{pro}
64	33431-00	DGC Caps

Module & Cart Electronics



Number	Part Number	Description
66	88001-00	Assy, Module, z.one _{pro}
67	88019-00	Assy, Dock Board, z.one _{pro}
68	88029-00	Assy, On/Off Board, z.one _{pro}
69	33886-00	Raw, DVD Drive, z.one _{pro}
70	34307-00	Assy, Adaptor SATA, z.one _{pro}
71	33886-00	Assy, Raw Drive +RW SATA, z.one _{pro}
72	34355-00	Cover, DVD, z.one _{pro}
73	38030-00	Cover, Module, z.one _{pro}
74	34433-00	Cover, Rear I/O, z.one _{pro}
75	88014-00	Cover, Column, z.one _{pro}

Internal Cabling



Number	Part Number	Description
80	34311-00	Cable, Pwr Module to Dock Bd, Pwr
81	34201-00	Cable, Pwr Module to Dock Bd, Comm
82	85160-00	Cable, Pwr Module to On/Off, Comm
83	34311-10 (2)	Cable, Pwr Module to Pwr Dist Bd (PDB), Pwr
84	34492-00	Cable, Pwr Dist to Printer, Pwr
85	34533-00 34546-00 34547-00	Cable, Power Cord, Latching, 115V Cable, Power Cord, Latching, UK Cable, Power Cord, Latching, 230V
86	34202-00	Cable, Dock Bd to Display, Video
87	32933-00	Cable, Dock Bd to UI, Comm
88	33905-00-00	Cable, UI to Printer, Video

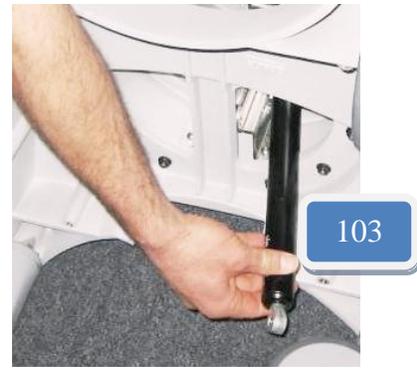
89	34311-30	Cable, Pwr Dist Bd (PDB) to Display, Pwr, z.one _{pro}
90	34313-00	Cable, Pwr Dist Bd (PDB) to UI, Pwr, z.one _{pro}
91	34311-20	Cable, Pwr Dist Bd (PDB) to DVD, Pwr, z.one _{pro}
92	33905-00	Cable, USB, UI to DVD, z.one _{pro}
93	85170-00	Cable, Ethernet Extension, z.one _{pro}

Power Module



Number	Part Number	Description
95	88012-00	Assy, Power Supply Module
96	85155-00	Assy, DC Board
97	34093-00	Assy, AC Board
98	34436-00	Assy, AC Inlet
99	85047-00	Cable, AC to DC supply
100	34533-00	Cable, Power Cord, Latching, 115V
	34546-00	Cable, Power Cord, Latching, UK
	34547-00	Cable, Power Cord, Latching, 230V

Miscellaneous Cart Items



Number	Part Number	Description
101	TBD	Directional Caster, z.one _{pro}
102	TBD	Locking Caster, z.one _{pro}
103	TBD	Gas Spring

Peripherals

Item	Part #	Description
104	40013-00	SONY, UP-711MD B/W Printer 
105	40012-00	SONY, UP-D25MD, Color Printer 
106	40011-00	Barcode Reader 

107 33064-00 2-Pedal Footswitch



Options and Upgrading Package

Item	Part #	Description
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108 115-061332-00 Field upgrade to Shared Service



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Document Title: z.one_{pro} Service Manual

Revision	Description of Change (Revision History)	Author(s)	Revision Date
A	Initial Release	D. Lisauskas	6/2014
B	Updates for 6.3 Project	D.Lisauskas	10/2015
3.0	Manufacturer Change	J.L	1/2017
4.0	Adding Echocardiography Option (FRU)	Jiang Yunjun	

Document Owner: Manual Team

