GE Healthcare

LOGIQ S8/LOGIQ E8

Service Manual

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This manual is a reference for the LOGIQ S8/LOGIQ E8 and LOGIQ S8 Vet ultrasound systems (Hereafter listed as LOGIQ S8). All information provided in this manual is relevant for all three systems unless otherwise specified.

Important Precautions

TRANSLATION POLICY

THIS SERVICE MANUAL IS AVAILABLE IN ENGLISH ONLY.

- **IF A CUSTOMER'S SERVICE PROVIDER REQUIRES A LANGUAGE OTHER THAN ENGLISH, IT IS THE CUSTOMER'S RESPONSIBILITY TO PROVIDE TRANSLATION SERVICES.**

WARNING (EN)

- **DO NOT ATTEMPT TO SERVICE THE EQUIPMENT UNLESS THIS SERVICE MANUAL HAS BEEN CONSULTED AND IS UNDERSTOOD.**
- **FAILURE TO HEED THIS WARNING MAY RESULT IN INJURY TO THE SERVICE PROVIDER, OPERATOR OR PATIENT FROM ELECTRIC SHOCK, MECHANICAL OR OTHER HAZARDS.**

CE MANUEL DE MAINTENANCE N'EST DISPONIBLE QU'EN ANGLAIS.

- **SI LE TECHNICIEN DU CLIENT A BESOIN DE CE MANUEL DANS UNE AUTRE LANGUE QUE L'ANGLAIS, C'EST AU CLIENT QU'IL INCOMBE DE LE FAIRE TRADUIRE.**

AVERTISSEMENT (FR)

- **NE PAS TENTER D'INTERVENTION SUR LES ÉQUIPEMENTS TANT QUE LE MANUEL SERVICE N'A PAS ÉTÉ CONSULTÉ ET COMPRIS.**
- **LE NON-RESPECT DE CET AVERTISSEMENT PEUT ENTRAÎNER CHEZ LE TECHNICIEN, L'OPÉRATEUR OU LE PATIENT DES BLESSURES DUES À DES DANGERS ÉLECTRIQUES, MÉCANIQUES OU AUTRES.**

DIESES KUNDENDIENST-HANDBUCH EXISTIERT NUR IN ENGLISCHER SPRACHE.

- **FALLS EIN FREMDER KUNDENDIENST EINE ANDERE SPRACHE BENÖTIGT, IST ES AUFGABE DES KUNDEN FÜR EINE ENTSPRECHENDE ÜBERSETZUNG ZU SORGEN.**

WARNUNG (DE)

- **VERSUCHEN SIE NICHT, DAS GERÄT ZU REPARIEREN, BEVOR DIESES KUNDENDIENST-HANDBUCH NICHT ZU RATE GEZOGEN UND VERSTANDEN WURDE.**
- **WIRD DIESE WARNUNG NICHT BEACHTET, SO KANN ES ZU VERLETZUNGEN DES KUNDENDIENSTTECHNIKERS, DES BEDIENERS ODER DES PATIENTEN DURCH ELEKTRISCHE SCHLÄGE, MECHANISCHE ODER SONSTIGE GEFAHREN KOMMEN.**

AVISO (ES)

ESTE MANUAL DE SERVICIO SÓLO EXISTE EN INGLÉS.

- **SI ALGÚN PROVEEDOR DE SERVICIOS AJENO A GEHC SOLICITA UN IDIOMA QUE NO SEA EL INGLÉS, ES RESPONSABILIDAD DEL CLIENTE OFRECER UN SERVICIO DE TRADUCCIÓN.**
- **NO SE DEBERÁ DAR SERVICIO TÉCNICO AL EQUIPO, SIN HABER CONSULTADO Y COMPRENDIDO ESTE MANUAL DE SERVICIO.**
- **LA NO OBSERVANCIA DEL PRESENTE AVISO PUEDE DAR LUGAR A QUE EL PROVEEDOR DE SERVICIOS, EL OPERADOR O EL PACIENTE SUFRAN LESIONES PROVOCADAS POR CAUSAS ELÉCTRICAS, MECÁNICAS O DE OTRA NATURALEZA.**

ATENÇÃO (PT-Br)

ESTE MANUAL DE ASSISTÊNCIA TÉCNICA SÓ SE ENCONTRA DISPONÍVEL EM INGLÊS.

- **SE QUALQUER OUTRO SERVIÇO DE ASSISTÊNCIA TÉCNICA, QUE NÃO A GEHC, SOLICITAR ESTES MANUAIS NOUTRO IDIOMA, É DA RESPONSABILIDADE DO CLIENTE FORNECER OS SERVIÇOS DE TRADUÇÃO.**
- **NÃO TENTE REPARAR O EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO ESTE MANUAL DE ASSISTÊNCIA TÉCNICA.**
- **O NÃO CUMPRIMENTO DESTE AVISO PODE POR EM PERIGO A SEGURANÇA DO TÉCNICO, OPERADOR OU PACIENTE DEVIDO A‘ CHOQUES ELÉTRICOS, MECÃNICOS OU OUTROS.**

AVISO (PT-pt)

ESTE MANUAL DE ASSISTÊNCIA ESTÁ DISPONÍVEL APENAS EM INGLÊS.

- **SE QUALQUER OUTRO SERVIÇO DE ASSISTÊNCIA TÉCNICA, QUE NÃO A GEHC, SOLICITAR ESTES MANUAIS NOUTRO IDIOMA, É DA RESPONSABILIDADE DO CLIENTE FORNECER OS SERVIÇOS DE TRADUÇÃO.**
- **NÃO TENTE EFECTUAR REPARAÇÕES NO EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO PREVIAMENTE ESTE MANUAL.**
- **A INOBSERVÂNCIA DESTE AVISO PODE RESULTAR EM FERIMENTOS NO TÉCNICO DE ASSISTÊNCIA, OPERADOR OU PACIENTE EM CONSEQUÊNCIA DE CHOQUE ELÉCTRICO, PERIGOS DE ORIGEM MECÂNICA, BEM COMO DE OUTROS TIPOS.**

AVVERTENZA (IT)

IL PRESENTE MANUALE DI MANUTENZIONE È DISPONIBILE SOLTANTO IN INGLESE.

- **SE UN ADDETTO ALLA MANUTENZIONE ESTERNO ALLA GEHC RICHIEDE IL MANUALE IN UNA LINGUA DIVERSA, IL CLIENTE È TENUTO A PROVVEDERE DIRETTAMENTE ALLA TRADUZIONE.**
- **SI PROCEDA ALLA MANUTENZIONE DELL’APPARECCHIATURA SOLO DOPO AVER CONSULTATO IL PRESENTE MANUALE ED AVERNE COMPRESO IL CONTENUTO.**
- **NON TENERE CONTO DELLA PRESENTE AVVERTENZA POTREBBE FAR COMPIERE OPERAZIONI DA CUI DERIVINO LESIONI ALL’ADDETTO ALLA MANUTENZIONE, ALL’UTILIZZATORE ED AL PAZIENTE PER FOLGORAZIONE ELETTRICA, PER URTI MECCANICI OD ALTRI RISCHI.**

HOIATUS (ET)

KÄESOLEV TEENINDUSJUHEND ON SAADAVAL AINULT INGLISE KEELES.

- **KUI KLIENDITEENINDUSE OSUTAJA NÕUAB JUHENDIT INGLISE KEELEST ERINEVAS KEELES, VASTUTAB KLIENT TÕLKETEENUSE OSUTAMISE EEST.**
- **ÄRGE ÜRITAGE SEADMEID TEENINDADA ENNE EELNEVALT KÄESOLEVA TEENINDUSJUHENDIGA TUTVUMIST JA SELLEST ARU SAAMIST.**
- **KÄESOLEVA HOIATUSE EIRAMINE VÕIB PÕHJUSTADA TEENUSEOSUTAJA, OPERAATORI VÕI PATSIENDI VIGASTAMIST ELEKTRILÖÖGI, MEHAANILISE VÕI MUU OHU TAGAJÄRJEL.**

VAROITUS (FI)

TÄMÄ HUOLTO-OHJE ON SAATAVILLA VAIN ENGLANNIKSI.

- **JOS ASIAKKAAN PALVELUNTARJOAJA VAATII MUUTA KUIN ENGLANNINKIELISTÄ MATERIAALIA, TARVITTAVAN KÄÄNNÖKSEN HANKKIMINEN ON ASIAKKAAN VASTUULLA.**
- **ÄLÄ YRITÄ KORJATA LAITTEISTOA ENNEN KUIN OLET VARMASTI LUKENUT JA YMMÄRTÄNYT TÄMÄN HUOLTO-OHJEEN.**
- **MIKÄLI TÄTÄ VAROITUSTA EI NOUDATETA, SEURAUKSENA VOI OLLA PALVELUNTARJOAJAN, LAITTEISTON KÄYTTÄJÄN TAI POTILAAN VAHINGOITTUMINEN SÄHKÖISKUN, MEKAANISEN VIAN TAI MUUN VAARATILANTEEN VUOKSI.**

ΠΡΟΕΙΔΟΠΟΙΗΣΗ (EL)

ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕΡΒΙΣ ΔΙΑΤΙΘΕΤΑΙ ΣΤΑ ΑΓΓΛΙΚΑ ΜΟΝΟ.

- **ΕΑΝ ΤΟ ΑΤΟΜΟ ΠΑΡΟΧΗΣ ΣΕΡΒΙΣ ΕΝΟΣ ΠΕΛΑΤΗ ΑΠΑΙΤΕΙ ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕ ΓΛΩΣΣΑ ΕΚΤΟΣ ΤΩΝ ΑΓΓΛΙΚΩΝ, ΑΠΟΤΕΛΕΙ ΕΥΘΥΝΗ ΤΟΥ ΠΕΛΑΤΗ ΝΑ ΠΑΡΕΧΕΙ ΥΠΗΡΕΣΙΕΣ ΜΕΤΑΦΡΑΣΗΣ.**
- **ΜΗΝ ΕΠΙΧΕΙΡΗΣΕΤΕ ΤΗΝ ΕΚΤΕΛΕΣΗ ΕΡΓΑΣΙΩΝ ΣΕΡΒΙΣ ΣΤΟΝ ΕΞΟΠΛΙΣΜΟ ΕΚΤΟΣ ΕΑΝ ΕΧΕΤΕ ΣΥΜΒΟΥΛΕΥΤΕΙ ΚΑΙ ΕΧΕΤΕ ΚΑΤΑΝΟΗΣΕΙ ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕΡΒΙΣ.**
- **ΕΑΝ ΔΕ ΛΑΒΕΤΕ ΥΠΟΨΗ ΤΗΝ ΠΡΟΕΙΔΟΠΟΙΗΣΗ ΑΥΤΗ, ΕΝΔΕΧΕΤΑΙ ΝΑ ΠΡΟΚΛΗΘΕΙ ΤΡΑΥΜΑΤΙΣΜΟΣ ΣΤΟ ΑΤΟΜΟ ΠΑΡΟΧΗΣ ΣΕΡΒΙΣ, ΣΤΟ ΧΕΙΡΙΣΤΗ Ή ΣΤΟΝ ΑΣΘΕΝΗ ΑΠΟ ΗΛΕΚΤΡΟΠΛΗΞΙΑ, ΜΗΧΑΝΙΚΟΥΣ Ή ΑΛΛΟΥΣ ΚΙΝΔΥΝΟΥΣ.**

FIGYELMEZTETÉS (HU)

EZEN KARBANTARTÁSI KÉZIKÖNYV KIZÁRÓLAG ANGOL NYELVEN ÉRHETŐ EL.

- **HA A VEVŐ SZOLGÁLTATÓJA ANGOLTÓL ELTÉRŐ NYELVRE TART IGÉNYT, AKKOR A VEVŐ FELELŐSSÉGE A FORDÍTÁS ELKÉSZÍTTETÉSE.**
- **NE PRÓBÁLJA ELKEZDENI HASZNÁLNI A BERENDEZÉST, AMÍG A KARBANTARTÁSI KÉZIKÖNYVBEN LEÍRTAKAT NEM ÉRTELMEZTÉK.**
- **EZEN FIGYELMEZTETÉS FIGYELMEN KÍVÜL HAGYÁSA A SZOLGÁLTATÓ, MŰKÖDTETŐ VAGY A BETEG ÁRAMÜTÉS, MECHANIKAI VAGY EGYÉB VESZÉLYHELYZET MIATTI SÉRÜLÉSÉT EREDMÉNYEZHETI.**

VIÐVÖRUN (IS)

ÞESSI ÞJÓNUSTUHANDBÓK ER EINGÖNGU FÁANLEG Á ENSKU.

- **EF ÞJÓNUSTUAÐILI VIÐSKIPTAMANNS ÞARFNAST ANNARS TUNGUMÁLS EN ENSKU, ER ÞAÐ Á ÁBYRGÐ VIÐSKIPTAMANNS AÐ ÚTVEGA ÞÝÐINGU.**
- **REYNIÐ EKKI AÐ ÞJÓNUSTA TÆKIÐ NEMA EFTIR AÐ HAFA SKOÐAÐ OG SKILIÐ ÞESSA ÞJÓNUSTUHANDBÓK.**
- **EF EKKI ER FARIÐ AÐ ÞESSARI VIÐVÖRUN GETUR ÞAÐ VALDIÐ MEIÐSLUM ÞJÓNUSTUVEITANDA, STJÓRNANDA EÐA SJÚKLINGS VEGNA RAFLOSTS, VÉLRÆNNAR EÐA ANNARRAR HÆTTU.**

VÝSTRAHA (CS)

TENTO SERVISNÍ NÁVOD EXISTUJE POUZE V ANGLICKÉM JAZYCE.

- **V PŘÍPADĚ, ŽE POSKYTOVATEL SLUŽEB ZÁKAZNÍKŮM POTŘEBUJE NÁVOD V JINÉM JAZYCE, JE ZAJIŠTĚNÍ PŘEKLADU DO ODPOVÍDAJÍCÍHO JAZYKA ÚKOLEM ZÁKAZNÍKA.**
- **NEPROVÁDĚJTE ÚDRŽBU TOHOTO ZAŘÍZENÍ, ANIŽ BYSTE SI PŘEČETLI TENTO SERVISNÍ NÁVOD A POCHOPILI JEHO OBSAH.**
- **V PŘÍPADĚ NEDODRŽOVÁNÍ TÉTO VÝSTRAHY MŮŽE DOJÍT ÚRAZU ELEKTRICKÁM PROUDEM PRACOVNÍKA POSKYTOVATELE SLUŽEB, OBSLUŽNÉHO PERSONÁLU NEBO PACIENTŮ VLIVEM ELEKTRICKÉHOP PROUDU, RESPEKTIVE VLIVEM K RIZIKU MECHANICKÉHO POŠKOZENÍ NEBO JINÉMU RIZIKU.**

ADVARSEL (DA)

DENNE SERVICEMANUAL FINDES KUN PÅ ENGELSK.

- **HVIS EN KUNDES TEKNIKER HAR BRUG FOR ET ANDET SPROG END ENGELSK, ER DET KUNDENS ANSVAR AT SØRGE FOR OVERSÆTTELSE.**
- **FORSØG IKKE AT SERVICERE UDSTYRET MEDMINDRE DENNE SERVICEMANUAL ER BLEVET LÆST OG FORSTÅET.**
- **MANGLENDE OVERHOLDELSE AF DENNE ADVARSEL KAN MEDFØRE SKADE PÅ GRUND AF ELEKTRISK, MEKANISK ELLER ANDEN FARE FOR TEKNIKEREN, OPERATØREN ELLER PATIENTEN.**

WAARSCHUWING (NL)

DEZE ONDERHOUDSHANDLEIDING IS ENKEL IN HET ENGELS VERKRIJGBAAR.

- **ALS HET ONDERHOUDSPERSONEEL EEN ANDERE TAAL VEREIST, DAN IS DE KLANT VERANTWOORDELIJK VOOR DE VERTALING ERVAN.**
- **PROBEER DE APPARATUUR NIET TE ONDERHOUDEN VOORDAT DEZE ONDERHOUDSHANDLEIDING WERD GERAADPLEEGD EN BEGREPEN IS.**
- **INDIEN DEZE WAARSCHUWING NIET WORDT OPGEVOLGD, ZOU HET ONDERHOUDSPERSONEEL, DE OPERATOR OF EEN PATIËNT GEWOND KUNNEN RAKEN ALS GEVOLG VAN EEN ELEKTRISCHE SCHOK, MECHANISCHE OF ANDERE GEVAREN.**

BRĪDINĀJUMS (LV)

ŠĪ APKALPES ROKASGRĀMATA IR PIEEJAMA TIKAI ANGĻU VALODĀ.

- **JA KLIENTA APKALPES SNIEDZĒJAM NEPIECIEŠAMA INFORMĀCIJA CITĀ VALODĀ, NEVIS ANGĻU, KLIENTA PIENĀKUMS IR NODROŠINĀT TULKOŠANU.**
- **NEVEICIET APRĪKOJUMA APKALPI BEZ APKALPES ROKASGRĀMATAS IZLASĪŠANAS UN SAPRAŠANAS.**
- **ŠĪ BRĪDINĀJUMA NEIEVĒROŠANA VAR RADĪT ELEKTRISKĀS STRĀVAS TRIECIENA, MEHĀNISKU VAI CITU RISKU IZRAISĪTU TRAUMU APKALPES SNIEDZĒJAM, OPERATORAM VAI PACIENTAM.**

ĮSPĖJIMAS (LT)

ŠIS EKSPLOATAVIMO VADOVAS YRA IŠLEISTAS TIK ANGLŲ KALBA.

- **JEI KLIENTO PASLAUGŲ TEIKĖJUI REIKIA VADOVO KITA KALBA – NE ANGLŲ, VERTIMU PASIRŪPINTI TURI KLIENTAS.**
- **NEMĖGINKITE ATLIKTI ĮRANGOS TECHNINĖS PRIEŽIŪROS DARBŲ, NEBENT VADOVAUTUMĖTĖS ŠIUO EKSPLOATAVIMO VADOVU IR JĮ SUPRASTUMĖTE**
- **NEPAISANT ŠIO PERSPĖJIMO, PASLAUGŲ TEIKĖJAS, OPERATORIUS AR PACIENTAS GALI BŪTI SUŽEISTAS DĖL ELEKTROS SMŪGIO, MECHANINIŲ AR KITŲ PAVOJŲ.**

ADVARSEL (NO)

DENNE SERVICEHÅNDBOKEN FINNES BARE PÅ ENGELSK.

- **HVIS KUNDENS SERVICELEVERANDØR TRENGER ET ANNET SPRÅK, ER DET KUNDENS ANSVAR Å SØRGE FOR OVERSETTELSE.**
- **IKKE FORSØK Å REPARERE UTSTYRET UTEN AT DENNE SERVICEHÅNDBOKEN ER LEST OG FORSTÅTT.**
- **MANGLENDE HENSYN TIL DENNE ADVARSELEN KAN FØRE TIL AT SERVICELEVERANDØREN, OPERATØREN ELLER PASIENTEN SKADES PÅ GRUNN AV ELEKTRISK STØT, MEKANISKE ELLER ANDRE FARER.**

OSTRZEŻENIE (PL)

NINIEJSZY PODRĘCZNIK SERWISOWY DOSTĘPNY JEST JEDYNIE W JĘZYKU ANGIELSKIM.

- **JEŚLI FIRMA ŚWIADCZĄCA KLIENTOWI USŁUGI SERWISOWE WYMAGA UDOSTĘPNIENIA PODRĘCZNIKA W JĘZYKU INNYM NIŻ ANGIELSKI, OBOWIĄZEK ZAPEWNIENIA STOSOWNEGO TŁUMACZENIA SPOCZYWA NA KLIENCIE.**
- **NIE PRÓBOWAĆ SERWISOWAĆ NINIEJSZEGO SPRZĘTU BEZ UPRZEDNIEGO ZAPOZNANIA SIĘ Z PODRĘCZNIKIEM SERWISOWYM.**
- **NIEZASTOSOWANIE SIĘ DO TEGO OSTRZEŻENIA MOŻE GROZIĆ OBRAŻENIAMI CIAŁA SERWISANTA, OPERATORA LUB PACJENTA W WYNIKU PORAŻENIA PRĄDEM, URAZU MECHANICZNEGO LUB INNEGO RODZAJU ZAGROŻEUŃ.**

ATENȚIE (RO)

ACEST MANUAL DE SERVICE ESTE DISPONIBIL NUMAI ÎN LIMBA ENGLEZĂ.

- **DACĂ UN FURNIZOR DE SERVICII PENTRU CLIENȚI NECESITĂ O ALTĂ LIMBĂ DECÂT CEA ENGLEZĂ, ESTE DE DATORIA CLIENTULUI SĂ FURNIZEZE O TRADUCERE.**
- **NU ÎNCERCAȚI SĂ REPARAȚI ECHIPAMENTUL DECÂT ULTERIOR CONSULTĂRII ŞI ÎNȚELEGERII ACESTUI MANUAL DE SERVICE.**
- **IGNORAREA ACESTUI AVERTISMENT AR PUTEA DUCE LA RĂNIREA DEPANATORULUI, OPERATORULUI SAU PACIENTULUI ÎN URMA PERICOLELOR DE ELECTROCUTARE, MECANICE SAU DE ALTĂ NATURĂ.**

ОСТОРОЖНО! (RU)

ДАННОЕ РУКОВОДСТВО ПО ОБСЛУЖИВАНИЮ ПРЕДОСТАВЛЯЕТСЯ ТОЛЬКО НА АНГЛИЙСКОМ ЯЗЫКЕ.

- **ЕСЛИ СЕРВИСНОМУ ПЕРСОНАЛУ КЛИЕНТА НЕОБХОДИМО РУКОВОДСТВО НЕ НА АНГЛИЙСКОМ ЯЗЫКЕ, КЛИЕНТУ СЛЕДУЕТ САМОСТОЯТЕЛЬНО ОБЕСПЕЧИТЬ ПЕРЕВОД.**
- **ПЕРЕД ОБСЛУЖИВАНИЕМ ОБОРУДОВАНИЯ ОБЯЗАТЕЛЬНО ОБРАТИТЕСЬ К ДАННОМУ РУКОВОДСТВУ И ПОЙМИТЕ ИЗЛОЖЕННЫЕ В НЕМ СВЕДЕНИЯ.**
- **НЕСОБЛЮДЕНИЕ УКАЗАННЫХ ТРЕБОВАНИЙ МОЖЕТ ПРИВЕСТИ К ТОМУ, ЧТО СПЕЦИАЛИСТ ПО ТЕХОБСЛУЖИВАНИЮ, ОПЕРАТОР ИЛИ ПАЦИЕНТ ПОЛУЧАТ УДАР ЗЛЕКТРИЧЕСКИМ ТОКОМ, МЕХАНИЧЕСКУЮ ТРАВМУ ИЛИ ДРУГОЕ ПОВРЕЖДЕНИЕ.**

ПРЕДУПРЕЖДЕНИЕ (BG)

ТОВА СЕРВИЗНО РЪКОВОДСТВО Е НАЛИЧНО САМО НА АНГЛИЙСКИ ЕЗИК.

- **АКО ДОСТАВЧИКЪТ НА СЕРВИЗНИ УСЛУГИ НА КЛИЕНТ СЕ НУЖДАЕ ОТ ЕЗИК, РАЗЛИЧЕН ОТ АНГЛИЙСКИ, ЗАДЪЛЖЕНИЕ НА КЛИЕНТА Е ДА ПРЕДОСТАВИ ПРЕВОДАЧЕСКА УСЛУГА.**
- **НЕ СЕ ОПИТВАЙТЕ ДА ИЗВЪРШВАТЕ СЕРВИЗНО ОБСЛУЖВАНЕ НА ТОВА ОБОРУДВАНЕ, ОСВЕН ВСЛУЧАЙ, ЧЕ СЕРВИЗНОТО РЪКОВОДСТВО Е ПРОЧЕТЕНО И СЕ РАЗБИРА.**
- **НЕСПАЗВАНЕТО НА ТОВА ПРЕДУПРЕЖДЕНИЕ МОЖЕ ДА ДОВЕДЕ ДО НАРАНЯВАНЕ НА ДОСТАВЧИКА НА СЕРВИЗНИ УСЛУГИ, НА ОПЕРАТОРА ИЛИ ПАЦИЕНТА ВСЛЕДСТВИЕНА ТОКОВ УДАР, МЕХАНИЧНИ ИЛИ ДРУГИ РИСКОВЕ.**

UPOZORENJE (SR)

OVAJ PRIRUČNIK ZA SERVISIRANJE DOSTUPAN JE SAMO NA ENGLESKOM JEZIKU.

- **AKO KLIJENTOV SERVISER ZAHTEVA JEZIK KOJI NIJE ENGLESKI, ODGOVORNOST JE NA KLIJENTU DA PRUŽI USLUGE PREVOĐENJA.**
- **NEMOJTE POKUŠAVATI DA SERVISIRATE OPREMU AKO NISTE PROČITALI I RAZUMELI PRIRUČNIK ZA SERVISIRANJE.**
- **AKO NE POŠTUJETE OVO UPOZORENJE, MOŽE DOĆI DO POVREĐIVANJA SERVISERA, OPERATERA ILI PACIJENTA UZROKOVANOG ELEKTRIČNIM UDAROM, MEHANIČKIM I DRUGIM OPASNOSTIMA.**

OPOZORILO (SL)

TA SERVISNI PRIROČNIK JE NA VOLJO SAMO V ANGLEŠČINI.

- **ČE PONUDNIK SERVISNIH STORITEV ZA STRANKO POTREBUJE NAVODILA V DRUGEM JEZIKU, JE ZA PREVOD ODGOVORNA STRANKA SAMA.**
- **NE POSKUŠAJTE SERVISIRATI OPREME, NE DA BI PREJ PREBRALI IN RAZUMELI SERVISNI PRIROČNIK.**
- **ČE TEGA OPOZORILA NE UPOŠTEVATE, OBSTAJA NEVARNOST ELEKTRIČNEGA UDARA, MEHANSKIH ALI DRUGIH NEVARNOSTI IN POSLEDIČNIH POŠKODB PONUDNIKA SERVISNIH STORITEV, UPORABNIKA OPREME ALI PACIENTA.**

UPOZORENJE (HR)

OVAJ SERVISNI PRIRUČNIK DOSTUPAN JE SAMO NA ENGLESKOM JEZIKU.

- **AKO KLIJENTOV SERVISER ZAHTIJEVA JEZIK KOJI NIJE ENGLESKI, ODGOVORNOST KLIJENTA JE PRUŽITI USLUGE PREVOĐENJA.**
- **NEMOJTE POKUŠAVATI SERVISIRATI OPREMU AKO NISTE PROČITALI I RAZUMJELI SERVISNI PRIRUČNIK.**
- **AKO NE POŠTUJETE OVO UPOZORENJE, MOŽE DOĆI DO OZLJEDE SERVISERA, OPERATERA ILI PACIJENTA PROUZROČENE STRUJNIM UDAROM, MEHANIČKIM I DRUGIM OPASNOSTIMA.**

UPOZORNENIE (SK)

TÁTO SERVISNÁ PRÍRUČKA JE K DISPOZÍCII LEN V ANGLIČTINE.

- **AK ZÁKAZNÍKOV POSKYTOVATEĽ SLUŽIEB VYŽADUJE INÝ JAZYK AKO ANGLIČTINU, POSKYTNUTIE PREKLADATEĽSKÝCH SLUŽIEB JE ZODPOVEDNOSŤOU ZÁKAZNÍKA.**
- **NEPOKÚŠAJTE SA VYKONÁVAŤ SERVIS ZARIADENIA SKÔR, AKO SI NEPREČÍTATE SERVISNÚ PRÍRUČKU A NEPOROZUMIETE JEJ.**
- **ZANEDBANIE TOHTO UPOZORNENIA MÔŽE VYÚSTIŤ DO ZRANENIA POSKYTOVATEĽA SLUŽIEB, OBSLUHUJÚCEJ OSOBY ALEBO PACIENTA ELEKTRICKÝM PRÚDOM, PRÍPADNE DO MECHANICKÉHO ALEBO INÉHO NEBEZPEČENSTVA.**

VARNING (SV)

DEN HÄR SERVICEHANDBOKEN FINNS BARA TILLGÄNGLIG PÅ ENGELSKA.

- **OM EN KUNDS SERVICETEKNIKER HAR BEHOV AV ETT ANNAT SPRÅK ÄN ENGELSKA ANSVARAR KUNDEN FÖR ATT TILLHANDAHÅLLA ÖVERSÄTTNINGSTJÄNSTER.**
- **FÖRSÖK INTE UTFÖRA SERVICE PÅ UTRUSTNINGEN OM DU INTE HAR LÄST OCH FÖRSTÅR DEN HÄR SERVICEHANDBOKEN.**
- **OM DU INTE TAR HÄNSYN TILL DEN HÄR VARNINGEN KAN DET RESULTERA I SKADOR PÅ SERVICETEKNIKERN, OPERATÖREN ELLER PATIENTEN TILL FÖLJD AV ELEKTRISKA STÖTAR, MEKANISKA FAROR ELLER ANDRA FAROR.**

DİKKAT (TR)

BU SERVİS KILAVUZU YALNIZCA İNGİLİZCE OLARAK SAĞLANMIŞTIR.

- **EĞER MÜŞTERİ TEKNİSYENİ KILAVUZUN İNGİLİZCE DIŞINDAKİ BİR DİLDE OLMASINI İSTERSE, KILAVUZU TERCÜME ETTİRMEK MÜŞTERİNİN SORUMLULUĞUNDADIR.**
- **SERVİS KILAVUZUNU OKUYUP ANLAMADAN EKİPMANLARA MÜDAHALE ETMEYİNİZ.**
- **BU UYARININ GÖZ ardI EDİLMESİ, ELEKTRİK ÇARPMASI YA DA MEKANİK VEYA DİĞER TÜRDEN KAZALAR SONUCUNDA TEKNİSYENİN, OPERATÖRÜN YA DA HASTANIN YARALANMASINA YOL AÇABİLİR.**

警告 (JA)

このサービスマニュアルには英語版しかありません。
GEHC 以外でサービスを担当される業者が英語以外の言語を要求される場合、翻訳作業はその業者の責任で行うものとさせていただきます。
このサービスマニュアルを熟読し理解せずに、装置のサービスを行わないで下さい。
この警告に従わない場合、サービスを担当される方、操作員あるいは患者さんが、感電や機械的又はその他の危険により負傷する可能性があります。

警告 (繁體中文) Traditional Chinese

本服務手冊僅提供英文版。

- 如顧客之服務提供者需要英文版以外之語言， 顧客需自行負擔其翻譯服務之責任。
- 在查閱並了解本服務手冊之內容前，請勿試圖維修本設備。
- 未確實遵守本警告，可能導致服務提供者、操作者或病患遭受電擊、機械危險或其他傷害。

注意:
(ZH-CN)

本维修手册仅存有英文本。
非 GEHC 公司的维修员要求非英文本的维修手册时，客户需自行负责翻译。
未详细阅读和完全了解本手册之前，不得进行维修。
忽略本注意事项会对维修员，操作员或病人造成触电，机械伤害或其他伤害。

경고
(KO)

- 본 서비스 지침서는 영어로만 이용하실 수 있습니다.
- 고객의 서비스 제공자가 영어이외 언어를 요구할 경우, 번역 서비스 지침서를 제공하는 것은 고객의 책임입니다.
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Tiếng Việt
(VI)

CẢNH BÁO

Hướng dẫn sử dụng dịch vụ này chỉ sẵn dùng bằng tiếng Anh.

- Nếu nhà cung cấp dịch vụ của khách hàng yêu cầu ngôn ngữ khác ngoài tiếng Anh, thì khách hàng phải có trách nhiệm cung cấp các dịch vụ dịch thuật.
- Không được tìm cách sửa chữa thiết bị trừ khi đã tham khảo và hiểu rõ Hướng dẫn sử dụng dịch vụ này.
- Bỏ qua lời cảnh báo này có thể gây thương tích cho nhà cung cấp dịch vụ, nhân viên vận hành hoặc bệnh nhân do sốc điện, những nguy hiểm về máy móc hoặc yếu tố khác.

ЕСКЕРТУ

Қазақ тілінде (КК)

Осы қызмет көрсету нұсқаулығы тек ағылшын тілінде қолжетімді.

- Егер тұтынушылардың қызметтер жеткізушісі ағылшын тілінен басқа тілді талап етсе, аудару қызметтерімен қамтамасыз ету тұтынушының жауапкершілігіне кіреді.
- Осы қызмет көрсету нұсқаулығын түсініп, ол туралы кеңес алмайынша жабдыққа қызмет көрсетуге тырыспаңыз.
- Осы ескертуді орындамау электр тогының соғуы, механикалық немесе басқа да қауіптер салдарынан қызметтер жеткізушісінің, оператордың немесе емделушінің жарақаттануына алып келуі мүмкін.

DAMAGE IN TRANSPORTATION

All packages should be closely examined at time of delivery. If damage is apparent write “Damage In Shipment” on ALL copies of the freight or express bill BEFORE delivery is accepted or “signed for” by a GE representative or hospital receiving agent. Whether noted or concealed, damage MUST be reported to the carrier immediately upon discovery, or in any event, within 14 days after receipt, and the contents and containers held for inspection by the carrier. A transportation company will not pay a claim for damage if an inspection is not requested within this 14 day period.

CERTIFIED ELECTRICAL CONTRACTOR STATEMENT - FOR USA ONLY

All electrical Installations that are preliminary to positioning of the equipment at the site prepared for the equipment shall be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations and testing shall be performed by qualified GE Healthcare personnel. In performing all electrical work on these products, GE will use its own specially trained field engineers. All of GE’s electrical work on these products will comply with the requirements of the applicable electrical codes.

The purchaser of GE equipment shall only utilize qualified personnel (i.e., GE’s field engineers, personnel of third-party service companies with equivalent training, or licensed electricians) to perform electrical servicing on the equipment.

OMISSIONS & ERRORS

If there are any omissions, errors or suggestions for improving this documentation, please contact the GE Healthcare Global Documentation Group with specific information listing the system type, manual title, part number, revision number, page number and suggestion details.

Mail the information to:

Service Documentation, 9900 Innovation Drive (RP-2123), Wauwatosa, WI53226, USA.

GE Healthcare employees should use Application Lifecycle Management (ALM) to report service documentation issues. These issues will then be in the internal problem reporting tool and communicated to the writer.

SERVICE SAFETY CONSIDERATIONS

DANGER **DANGEROUS VOLTAGES, CAPABLE OF CAUSING DEATH, ARE PRESENT IN THIS EQUIPMENT. USE EXTREME CAUTION WHEN HANDLING, TESTING AND ADJUSTING.**

WARNING ***USE ALL PERSONAL PROTECTION EQUIPMENT (PPE) SUCH AS GLOVES, SAFETY SHOES, SAFETY GLASSES, AND KNEELING PAD, TO REDUCE THE RISK OF INJURY.***

For a complete review of all safety requirements, see the Chapter 1, Safety Considerations section in the Service Manual.

LEGAL NOTES

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Revision History

Revision	Date	Reason for change
1	Jun. 2011	Initial Release
2	Jul. 2011	Correction
3	Mar. 2012	Correction
4	May. 2013	Initial release for R2.x
5	March.. 2014	Minor correctionfor R2.x
6	July, 2015	Release for R3
7	September, 2015	Update
8	November, 2015	Update BW Printer setup
9	Februry, 2016	Add UDI label information
10	Februry, 2017	Update adding R4 information
11	June, 2017	Revise with Service Note information
12	October, 2017	Add Installation Instruction information
13	March, 2019	Update for R4.2.5x release

List of Effected Pages (LOEP)

Pages	Revision	Pages	Revision	Pages	Revision
Title Page	12	Chapter 3	12	Chapter 8	12
Warnings i to xii	12	Chapter 4	12	Chapter 9	12
TOC	12	Chapter 5	12	Chapter 10	12
Chapter 1	12	Chapter 6	12	Back Cover	N/A
Chapter 2	12	Chapter 7	12		

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CHAPTER 8
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Chapter 1
Introduction

Section 1-1
Overview

1-1-1 Purpose of this chapter

This chapter describes important issues related to safely servicing LOGIQ S8. The service provider must read and understand all the information presented here before installing or servicing a unit.

Attention

This manual contains necessary and sufficient information for the Field Service Engineer or Biotech Engineer to maintain and service the system safely. Advanced equipment training may be provided by factory trained Field Service trainers for the agreed-upon time period.

This service manual provides installation and service information for the LOGIQ S8 ultrasound system as shown in Table 1-1 "Contents in this service manual" on page 1-2.

NOTE: Ensure you are working with the latest version of the Proprietary Service Manual. Consult the CDL and OnBase to confirm and to download the latest version.

1-1-2 Contents in this chapter

Section 1-2
Service manual overview

1-2-1 Contents in this service manual

The service manual is divided into ten chapters.

In the beginning of the manual, before chapter 1, you will find the language policy for GE Healthcare's service documentation, legal information, a revision overview, and the Table of Contents (TOC).

Table 1-1 Contents in this service manual

CHAPTER NUMBER	CHAPTER TITLE	DESCRIPTION
1	Introduction	Contains a content summary and warnings.
2	Site preparations	Contains pre-setup requirements for the LOGIQ S8.
3	System Setup	Contains setup procedure with procedure checklist.
4	Functional Checks	Contains functional checks that must be performed as part of the installation, or as required during servicing and periodic maintenance.
5	Components and Functions (Theory)	Contains block diagrams and functional explanations of the electronics.
6	Service Adjustments	Contains instructions on how to make any available adjustments to the LOGIQ S8.
7	Diagnostics/Troubleshooting	Provides procedures for running diagnostic or related routines for the LOGIQ S8.
8	Replacement Procedures	Provides disassembly procedures and reassembly procedures for all changeable FRUs, available option installation instructions, and upgrade installation instructions.
9	Renewal Parts	Contains a complete list of replacement parts for the LOGIQ S8.
10	Care & Maintenance	Provides periodic maintenance procedures for LOGIQ S8.
N/A	Index	A quick way to the topic you're looking for.

1-2-2 Typical users of the Service Manual

- GE Service Personnel (Setup, maintenance, etc.)
- Hospital Service Personnel
- Architectural Planners/Installation Planners (some parts of Chapter 2 - Site preparations)

1-2-3 Models covered by this manual

Table 1-2 LOGIQ S8 Models

MODEL NUMBER	DESCRIPTION	R1	R2	R3	R4	R4.2.5x
5418099	LOGIQ S8 Console, BASIC configuration	Y	U	U*	N	N
5418100	LOGIQ S8 Console, CHINA configuration	Y	U	U*	N	N
5418101	LOGIQ S8 Console, JAPAN configuration	Y	U	U*	N	N
5418102	LOGIQ S8 Console, KOREA configuration	Y	U	U*	N	N
5418103	LOGIQ S8 Console, INDIA configuration	Y	U	U*	N	N
5418104	LOGIQ S8 Console, USA configuration	Y	U	U*	N	N
5418105	LOGIQ S8 Console, CANADA configuration	Y	U	U*	N	N
5478057	LOGIQ S8 R2 - 110V	N	Y	U*	N	N
5478058	LOGIQ S8 R2 - 220V	N	Y	U*	N	N
5669845	LOGIQ S8 R3	N	N	Y	U	N
5669847	LOGIQ S8 R3 with OLED monitor	N	N	Y	U	N
5756373	LOGIQ S8 R4 with OLED monitor	N	N	N	Y	U
5815518	LOGIQ S8 R4.2.5x with OLED monitor	N	N	N	N	Y
5808841	LOGIQ S8 R4.2.5x with LCD monitor	N	N	N	N	Y

Table 1-3 LOGIQ S8 Vet Models

MODEL NUMBER	DESCRIPTION	R1	R2	R3	R4	R4.2.5x
5459532	LOGIQ S8 Vet - USA	Y	N	N	N	N
5478475	LOGIQ S8 Vet R2 - 110V	N	Y	U*	N	N
5478476	LOGIQ S8 Vet R2 - 220V	N	Y	U*	N	N
5604017	LOGIQ S8 Vet Upgrade kit	N	N	U*	U*	U*

1-2-3 Models covered by this manual (cont'd)

Table 1-4 LOGIQ E8 Model (ship only for People's Republic of China)

MODEL NUMBER	DESCRIPTION	R1	R2	R3	R4.2.5x
5486788	LOGIQ E8 R2	N	Y	U*	N
5669848	LOGIQ E8 R3 OLED	N	N	Y	N
5818169	LOGIQ E8 R4.2.5x OLED	N	N	N	Y

Software Configurations and Hardware/Software Compatibility - Upgrade Options

Y: Original, U: Upgrade available, N: Not supported

U*: Upgrade available. (No LCD upgrade)

1-2-4 Product description

1-2-4-1 Overview of the LOGIQ S8/LOGIQ E8 ultrasound system

The LOGIQ S8/LOGIQ E8 ultrasound system is a high performance digital ultrasound imaging system with total data management.

This system provides image generation in B-Mode, Color Doppler, Power Doppler, M-Mode, Color M-Mode, PW/CW and 3D/4D, Tissue Velocity imaging, Volume-Guided Ultrasound, Elastography, and Contrast applications.

The fully digital architecture of the LOGIQ S8/LOGIQ E8 allows optimal usage of all scanning modes and probe types throughout the full spectrum of operating frequencies.

Signal flows from the Probe Connector Panel to the Front End, and then over to the Back End Processor and finally to the monitor and peripherals.

System configuration is stored on the hard drive in the Back End Processor.

All necessary software is loaded from the hard drive on power up.

Section 1-3
Important conventions

1-3-1 Conventions used in this manual

1-3-1-1 Icons

The pictures, or icons, are used wherever they will reinforce the printed message. The icons, labels, and conventions used on the product and in the service information are described in this chapter.

1-3-1-2 Safety precaution messages

Various levels of safety precaution messages may be found on the equipment and in the service information. The different levels of concern are identified by a flag word that precedes the precautionary message. Known or potential hazards to personnel are labeled in one of three ways:

DANGER **DANGER IS USED TO INDICATE THE PRESENCE OF A HAZARD THAT WILL CAUSE SEVERE PERSONAL INJURY OR DEATH IF THE INSTRUCTIONS ARE IGNORED.**

WARNING **WARNING IS USED TO INDICATE THE PRESENCE OF A HAZARD THAT CAN CAUSE SEVERE PERSONAL INJURY AND PROPERTY DAMAGE IF INSTRUCTIONS ARE IGNORED.**

CAUTION **CAUTION IS USED TO INDICATE THE PRESENCE OF A HAZARD THAT WILL OR CAN CAUSE MINOR PERSONAL INJURY AND PROPERTY DAMAGE IF INSTRUCTIONS ARE IGNORED. EQUIPMENT DAMAGE POSSIBLE.**

When a hazard is present that can cause property damage, but has absolutely no personal injury risk, a NOTICE is used.

NOTICE **Notice is used when a hazard is present that can cause property damage but has absolutely no personal injury risk.**

Notice Example: Disk drive may crash.

NOTE: Notes are used to provide important information about an item or a procedure. Be sure to read the notes; the information contained in a note can often save you time or effort.

1-3-2 Standard Hazard Icons

Important information will always be preceded by the exclamation point (!) contained within a triangle, or the symbols for “Danger”, “Warning” or “Caution”, as seen throughout this chapter. In addition to text, several different graphical icons (symbols) may be used to make you aware of specific types of hazards that could cause harm.

Even if a symbol isn’t used in this manual, it is included for your reference.

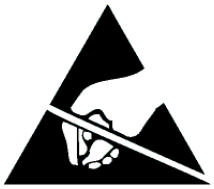
Table 1-5 Standard Hazard Icons

ELECTRICAL	BIOHAZARD	RADIATION
 or		
LASER	**HEAT**	**PINCH**
		 or 
ACOUSTIC OUTPUT	**EXPLOSION**	
		
MOVING	**DANGER/WARNING/ CAUTION**	**SMOKE/FIRE**
		

1-3-2-1 Standard Icons that indicate that a special procedure is to be used

Other hazard icons make you aware of specific procedures that should be followed.

Table 1-6 Standard Icons Indicating a Special Procedure be Used

AVOID STATIC ELECTRICITY	TAG AND LOCK OUT	WEAR EYE PROTECTION
		
WEAR HAND PROTECTION	**WEAR FOOT PROTECTION**	
		

1-3-3 Product Icons

The following table describes the purpose and location of safety labels and other important information provided on the equipment.

Table 1-7 Label Icons

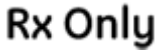
Label/Icon	Purpose/Meaning	Location
	Identification and Rating Plate Manufacturer's name and address	Rating Plate
	Identification and Rating Plate Date of manufacture	Rating Plate
	Serial Number	Rating Plate
	Catalog Number	Rating Plate
	United States only Prescription Requirement label	Rear of the system
	CE Mark The CE Mark of Conformity indicates this equipment conforms with the Council Directive 93/42/EEC.	Rear of the system
	Authorized European Representative address	Rear of the system
IP Code (IPX8)	Indicates the degree of protection provided by the enclosure per IEC60 529. Can be used in operating room environment.	Footswitch
	Type B Applied Part symbol is in accordance with IEC 60878-02-03.	Probe marked Type B
	Type BF Applied Part (man in the box) symbol is in accordance with IEC 60878-02-03.	Probe marked Type BF
	Defibrillation-proof applied part type BF.	ECG connector
	Type CF Applied Part (heart in the box) symbol is in accordance with IEC 60878-02-03.	eTrax Needle

Table 1-7 Label Icons(Continued)

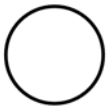
Label/Icon	Purpose/Meaning	Location
	Follow instruction for use.	Rear of the system Probe connector
	Symbol indicating that the Instructions for Use are supplied in electronic form.	Rear Panel
	“General Warning Sign”	Rear of the system
	“Warning” - Dangerous voltage” (the lightning flash with arrowhead) is used to indicate electric shock hazards.	Internal
	“Mains OFF” indicates the power off position of the mains power breaker.	Rear of the system
	“Mains ON” indicates the power on position of the mains power breaker.	Rear of the system
	“ON” indicates the power on position of the power button. CAUTION: This Power button DOES NOT ISOLATE Mains Supply.	R1/R2/R3 Operator control panel
	Stand-by. The standby symbol (line partially within a broken circle), indicates a sleep mode or low power state. Blue: Stand-by or sleep mode Green: Power on	R4 Operator control panel
	“Protective Earth” indicates the protective earth (grounding) terminal.	Internal

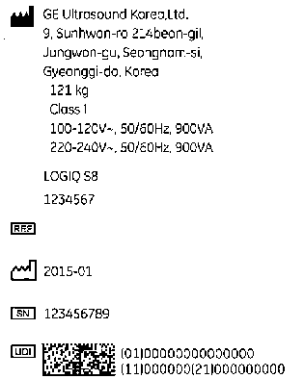
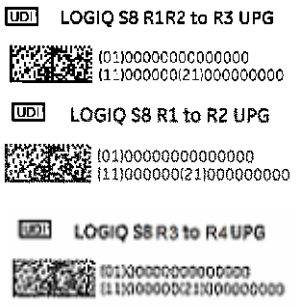
Table 1-7 Label Icons(Continued)

Label/Icon	Purpose/Meaning	Location
	"Equipotentiality" indicates the terminal to be used for connecting equipotential conductors when interconnecting (grounding) with other equipment. Connection of additional protective earth conductors or potential equalization conductors is not necessary in most cases and is only recommended for situations involving multiple equipment in a high-risk patient environment to provide assurance that all equipment is at the same potential and operates within acceptable leakage current limits. An example of a high-risk patient would be a special procedure where the patient has an accessible conductive path to the heart such as exposed cardiac pacing leads.	Rear of the system
	This symbol indicates that waste electrical and electronic equipment must not be disposed of as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.	Rear of the system
		Probe connector
	The separate collection symbol is affixed to a battery, or its packaging, to advise you that the battery must be recycled or disposed of in accordance with local or country laws. The letters below the separate collection symbol indicate whether certain elements (Pb=Lead, Cd=Cadmium, Hg=Mercury) are contained in the battery. To minimize potential effects on the environment and human health, it is important that all marked batteries that you remove from the product are properly recycled or disposed. For information on how the battery may be safely removed from the device, please consult the service manual or equipment instructions. Information on the potential effects on the environment and human health of the substances used in batteries is available at this url: http://www.gehealthcare.com/euen/weee-recycling/index.html	Battery Pack if contains Pb/Cd/Hg
	Indicates the presence of hazardous substance(s) above the maximum concentration value. Maximum concentration values for electronic information products, as set by the People's Republic of China Electronic Industry Standard SJ/T11364-2006, include the hazardous substances of lead, mercury, hexavalent chromium, cadmium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE). "10" indicates the number of years during which the hazardous substance(s) will not leak or mutate so that the use of this product will not result in any severe environmental pollution, bodily injury, or damage to any assets.	Probe connector

Table 1-7 Label Icons(Continued)

Label/Icon	Purpose/Meaning	Location
	Indicates the presence of hazardous substance(s) above the maximum concentration value. Maximum concentration values for electronic information products, as set by the People's Republic of China Electronic Industry Standard SJ/T11364-2006, include the hazardous substances of lead, mercury, hexavalent chromium, cadmium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE). "20" indicates the number of years during which the hazardous substance(s) will not leak or mutate so that the use of this product will not result in any severe environmental pollution, bodily injury, or damage to any assets.	Rear of the system
	Do not use the following devices near this equipment: cellular phone, radio receiver, mobile radio transmitter, radio controlled toy, broadband power lines, etc. Use of these devices near this equipment could cause this equipment to perform outside the published specifications. Keep power to these devices turned off when near this equipment.	Rear of the system
	This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or country laws. (Within this system, the backlight lamps in the monitor display, contain mercury.)	Rear of the system
	UL conformity mark according to UL 60601-1 and CAN/CSA C22/2 NO. 601.1:.	R1 to R3 Leg of the rear caster
	UL conformity mark according to ANSI/AAMI ES60601-1:2005/ (R)2012, CAN/CSA-C22.2 No. 60601-1:14.	R4 and later Leg of the rear caster
	ISO 7010 - P007 Volume Navigation Pacemaker Warning. No access for person with pacemaker.	V Nav Transmitter
	How to lock Operator Panel prior to transport	Rear of the system.
	DO NOT place a finger, hand or any object on the joint of the monitor or monitor arm to avoid injury when moving the monitor and monitor arm.	Rear of the LCD monitor.
	DO NOT push the system. Use the handle to push/pull the system, e.g., DO NOT use the LCD. Failure to do so may cause serious injury or system damage.	Rear of the system

Table 1-7 Label Icons(Continued)

Label/Icon	Purpose/Meaning	Location
	Caution	Probe connector
	Non-Ionizing Electromagnetic Radiation	Neck of Monitor arm, on equipped with Wireless LAN
	This system is for animal use only. Do not mix up with human diagnosis.	Rear of the LS8 Vet system
	GOST Symbol. Russia Regulatory Country Clearance.	Under the rating plate
	EAC Mark of Conformity. Image of the Common Mark of Products Circulation in the market of the Customs Union member-states.	Under the rating plate
	Every system has a unique marking for identification, the Unique Device Identification (UDI) Label. The UDI label consists of a series of alpha-numeric characters and barcode which uniquely identify the LOGIQ S8 system as a medical device manufactured by General Electric. Scan or enter the UDI information into the patient health record as required by country-specific laws.	Rating Plate
		Upgraded LOGIQ S8 systems, UDI label is on the left-rear caster.
		Probe UDI label

Section 1-4
Safety Considerations

1-4-1 Contents in this section

1-4-2 Introduction

The following safety precautions must be observed during all phases of operation, service and repair of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in this manual, violates safety standards of design, manufacture and intended use of the equipment.

1-4-3 Human Safety

- Operating personnel must not remove the system covers, except for removing front cover to clean air filter.
- Servicing should be performed by authorized personnel only.

Only personnel who have participated in a LOGIQ S8 Training are authorized to service the equipment.

DANGER **DANGEROUS VOLTAGES, CAPABLE OF CAUSING DEATH, ARE PRESENT IN THIS EQUIPMENT.**
USE EXTREME CAUTION WHEN HANDLING, TESTING AND ADJUSTING.

WARNING ***IF THE COVERS ARE REMOVED FROM AN OPERATING LOGIQ S8, SOME METAL SURFACES MAY BE WARM ENOUGH TO POSE A POTENTIAL HEAT HAZARD IF TOUCHED, EVEN WHILE IN SHUTDOWN MODE.***

WARNING ***BECAUSE OF THE LIMITED ACCESS TO CABINETS AND EQUIPMENT IN THE FIELD, PLACING PEOPLE IN AWKWARD POSITIONS, GE HAS LIMITED THE LIFTING WEIGHT FOR ONE PERSON IN THE FIELD TO 16 KG (35 LBS). ANYTHING OVER 16 KG (35 LBS) REQUIRES 2 PEOPLE.***

WARNING ***USE ALL PERSONAL PROTECTION EQUIPMENT (PPE) SUCH AS GLOVES, SAFETY SHOES, SAFETY GLASSES, AND KNEELING PAD, TO REDUCE THE RISK OF INJURY.***

WARNING ***WEAR ALL PPE INCLUDING GLOVES AS INDICATED IN THE CHEMICAL MSDS.***

WARNING ***EXPLOSION WARNING***
DO NOT OPERATE THE EQUIPMENT IN AN EXPLOSIVE ATMOSPHERE. OPERATION OF ANY ELECTRICAL EQUIPMENT IN SUCH AN ENVIRONMENT CONSTITUTES A DEFINITE SAFETY HAZARD.

WARNING ***DO NOT SUBSTITUTE PARTS OR MODIFY EQUIPMENT***

BECAUSE OF THE DANGER OF INTRODUCING ADDITIONAL HAZARDS, DO NOT INSTALL SUBSTITUTE PARTS OR PERFORM ANY UNAUTHORIZED MODIFICATION OF THE EQUIPMENT.

WARNING ***ENSURE THAT THE SYSTEM IS TURNED OFF AND UNPLUGGED.***

WAIT FOR AT LEAST 20 SECONDS FOR CAPACITORS TO DISCHARGE AS THERE ARE NO TEST POINTS TO VERIFY ISOLATION. THE BLUE LIGHT ON THE POWER BUTTON WILL TURN OFF.

WARNING ***RISK OF ELECTRICAL SHOCK, SYSTEM MUST BE TURNED OFF AND DISCONNECTED FROM POWER SOURCE. CORD MUST BE CONTROLLED AT ALL TIMES.***

WARNING ***USE EXTREME CAUTION AS LONG AS THE LOGIQ S8/LOGIQ E8 IS UN-STABLE, NOT RESTING ON ALL FOUR CASTERS.***

WARNING ***TILTING THE CONSOLE REQUIRES TWO PEOPLE IN ORDER TO AVOID INJURY TO SERVICE PERSONNEL AND DAMAGE TO THE EQUIPMENT.***

WARNING ***BEWARE OF POSSIBLE SHARP EDGES ON ALL MECHANICAL PARTS. IF SHARP EDGES ARE ENCOUNTERED, THE APPROPRIATE PPE SHOULD BE USED TO REDUCE THE RISK OF INJURY.***

1-4-4 Mechanical Safety

WARNING ***USE EXTREME CAUTION WHEN ELEVATING THE UNIT, OR IF IT IS RAISED FOR A REPAIR OR MOVED ALONG ANY INCLINE. THE LOGIQ S8 SYSTEM MAY BECOME UNSTABLE WHICH COULD CAUSE A TIP OVER.***

WARNING ***ULTRASOUND PROBES ARE HIGHLY SENSITIVE MEDICAL INSTRUMENTS THAT CAN EASILY BE DAMAGED BY IMPROPER HANDLING. USE CARE WHEN HANDLING AND PROTECT FROM DAMAGE WHEN NOT IN USE. DO NOT USE A DAMAGED OR DEFECTIVE PROBE. FAILURE TO FOLLOW THESE PRECAUTIONS CAN RESULT IN SERIOUS INJURY AND EQUIPMENT DAMAGE.***

WARNING ***NEVER USE A PROBE THAT HAS FALLEN TO THE FLOOR. EVEN IF IT LOOKS OK, IT MAY BE DAMAGED.***

WARNING ***WHEN THE UNIT IS RAISED FOR A REPAIR OR MOVED ALONG ANY INCLINE, USE EXTREME CAUTION SINCE IT MAY BECOME UNSTABLE AND TIP OVER.***

CAUTION **The system weighs approximately 85 kg (LOGIQ S8) / 97 kg (LOGIQ E8) or more, depending on installed peripherals, when ready for use.**

Care must be used when moving it or replacing its parts. Failure to follow the precautions listed could result in injury, uncontrolled motion and costly damage.

ALWAYS:

- **Use the handle to move the system.**
- **Be sure the pathway is clear.**
- **Use slow, careful motions.**
- **Do not let the system strike walls or door frames.**

Two people are required when moving on inclines or lifting more than 16 kg (35 lbs).

CAUTION ***THE SYSTEM SHOULD NOT BE MOVED WITH THE OPERATOR I/O PANEL EXTENDED. MOVE THE OPERATOR I/O PANEL TO ITS CENTERED AND LOCKED POSITION. LOWER THE OPERATOR I/O PANEL AS MUCH AS POSSIBLE BEFORE MOVING THE SYSTEM.***

CAUTION **Before you move or transport the system, make sure to lock the LCD monitor firmly and flip down the monitor to prevent damage to the system.**

CAUTION **To avoid injury when you move the LCD monitor and the monitor arm, DO NOT put your finger, hand, or object on the joint of the monitor or the monitor arm.**

CAUTION **To avoid injury or damage to the monitor, make sure there is nothing within range of the LCD before moving the monitor and monitor arm. This includes people as well as things.**

CAUTION **Ensure that nobody touches the console arm/frogleg when moving the Operator Panel.**

CAUTION 

Use Protective Glasses during drilling, filing and during all other work where eyes need protection.

CAUTION 

Use Safety Shoes when doing work where there is any chance of foot damage.

CAUTION 

Use Protective Gloves when drilling and cutting.

NOTICE Be careful not to pinch any of the cables.

NOTE: Special care should be taken when transporting the unit in a vehicle, see 4-3-8-3 "Transporting the System" on page 4-16.

1-4-5 Electrical Safety

1-4-5-1 Safe Practices

To minimize shock hazard, the equipment chassis must be connected to an electrical ground.

The system is equipped with a three-conductor AC power cable. This must be plugged into an approved electrical outlet with safety ground. If an extension cord is used with the system, make sure that the total current rating of the system does not exceed the extension cord rating.

The power outlet used for this equipment should not be shared with other types of equipment.

Both the system power cable and the power connector meet international electrical standards.

WARNING ***CONNECTING A LOGIQ S8/LOGIQ E8 SCANNER TO THE WRONG VOLTAGE LEVEL WILL MOST LIKELY DESTROY IT.***

1-4-5-2 Probes

All the probes for the LOGIQ S8 are designed and manufactured to provide trouble-free, reliable service. To ensure this, correct handling of probes is important and the following points should be noted:

- Do not drop a probe or strike it against a hard surface, as this may damage the transducer elements, acoustic lens, or housing.
- Inspect the probe prior to each use for damage or degradation to the housing, cable strain relief, lens, seal, connector pins and locking mechanism.
- Do not use a cracked or damaged probe. In this event, call your field service representative immediately to obtain a replacement.
- Avoid pulling, pinching or kinking the probe cable, since a damaged cable may compromise the electrical safety of the probe.
- To avoid the risk of a probe accidentally falling, do not allow the probe cables to become entangled, or to be caught in the machine's wheels.
- Never immerse the probe connector or adapter into any liquid.

NOTE: For detailed information on handling probes, refer to the Basic User Manual and the care card supplied with the probe.

1-4-6 Auxiliary Devices Safety

WARNING ***Power Supplies for additional equipment MUST comply with IEC 60601-1.***

WARNING ***DO NOT attempt to use different peripherals and accessories (brand and model; connected via USB ports) other than approved and provided by GE Healthcare! The ultrasound system is an extremely sensitive and complex medical system. Any unauthorized peripherals may cause system failure or damage!***

WARNING ***After each installation, the leakage currents have to be measured according to IEC 60601-1 respectively UL 60601-1.***

The LOGIQ S8 may be used with an isolation transformer to provide the required separation from mains for both, the system and the auxiliary devices.

One AUX main outlet is located at the primary power supply. It is used for connecting the two-fold splitter whose outlets are led to the shelves intend for auxiliary devices (e.g., printers) and the AUX main outlet that is accessible on the back of the control console.

The IEC 60601-1-1 standard provides a guideline for safely interconnecting medical devices in systems. “Equipment connected to the analog or digital interface must comply with the respective IEC/UL standards (e.g. IEC 60950 / UL 60950 for data processing equipment and IEC 60601-1 / UL 60601-1 for medical equipment).

Everybody who connects additional equipment to the signal input portion or signal output portion configures a medical system, and is therefore responsible that the system complies with the requirements of the system standard IEC 60601-1-1.

Special care has to be taken, if the device is connected to computer network (e.g., Ethernet), because other devices could be connected without any control. There could be a potential difference between the protective earth and any line of the computer network including the shield.

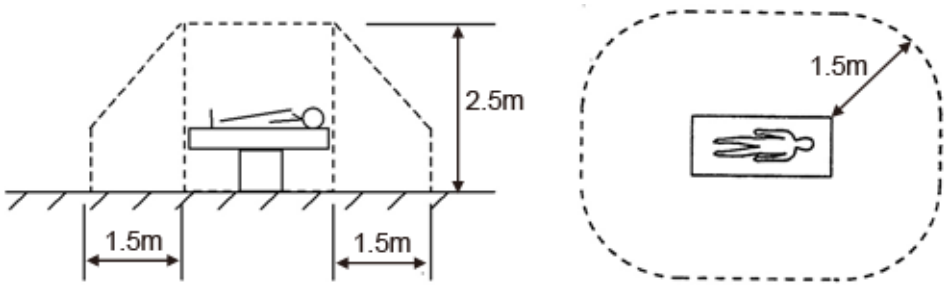
In this case the only way to operate the system safely is to use an isolated signal link with minimum 4mm creepage distance, 2.5mm air clearance of the isolation device. For computer networks there are media converters available which convert the electrical to optical signals. Please consider that this converter has to comply with IEC xxx standards***** and is battery operated or connected to the isolation mains output of the LOGIQ S8.

***** IEC xxx stands for standards such as:

- IEC 60601 for medical devices
- IEC 60950 for information technology equipment etc.

CAUTION **The leakage current of the entire system including any / all auxiliary equipment must not exceed the limit values as per EN 60601-1-1:1990 (IEC 60601-1-1) respectively other valid national or international standards. All equipment must comply with UL, CSA and IEC requirements.**

CAUTION **Please observe that some printers may not be medical devices! If the Bluetooth Printer and/or Line Printers are no medical devices, they have to be located outside of the patient environment (according to IEC 60601-1 / UL 60601-1).**



CAUTION **Auxiliary equipment must only be connected to the main console with the special main outlet provided for the electrical safety of the system.**

CAUTION **Auxiliary equipment with direct main connection requires galvanic separation of the signal and/ or control leads.**

NOTICE **The system integrator** (any person connecting the medical device to other devices) **is responsible that the connections are safe.**
If in doubt, consult the technical service department or your local representative.

NOTICE All peripherals mounted on the LOGIQ S8 system chassis must be firmly secured in position.

NOTICE Each signal output (DVI, D-SUB (VGA), S-VIDEO, COMPOSITE (BNC), COMPOSITE (RCA)) of UVC (Universal Video Converter) is insulated.

1-4-7 Battery Safety

NOTE: The LOGIQ S8 ultrasound system is supplied with a lithium ion battery in the power supply module, as option.

The lithium ion technology used in the system's battery is significantly less hazardous to the environment than the lithium metal technology used in some other batteries (such as watch batteries). Used batteries should not be placed with common household waste products. Contact local authorities for the location of a chemical waste collection program nearest you.

NOTE: Regulations vary for different countries. Dispose of a used battery in accordance with local regulations.

WARNING ***THE LOGIQ S8 BATTERY HAS A SAFETY DEVICE.***
DO NOT ATTEMPT TO DIS-ASSEMBLE OR ALTER THE BATTERY!
ALWAYS OBSERVE THE FOLLOWING PRECAUTIONS:

CAUTION **USE ONLY BATTERIES APPROVED BY GE HEALTHCARE AS SUITABLE FOR USE WITH THE LOGIQ S8/LOGIQ E8 ULTRASOUND SYSTEM.**

- DO NOT short-circuit the battery by directly connecting the negative terminals with metal objects.
- DO NOT heat the battery or discard it in a fire.
- DO NOT expose the battery to temperatures over 50 °C. Keep the battery away from fire and other heat sources.
- DO NOT charge the battery near a heat source, such as, a fire or heater.
- DO NOT leave the battery in direct sunlight.
- DO NOT pierce the battery with a sharp object, hit it, or step on it.
- DO NOT use a damaged battery.
- DO NOT apply solder to a battery.
- DO NOT connect the battery to an electrical power outlet.

CAUTION **TO PREVENT THE BATTERY BURSTING, IGNITING, OR FUMES FROM THE BATTERY CAUSING EQUIPMENT DAMAGE, ALWAYS OBSERVE THE FOLLOWING PRECAUTIONS:**

- DO NOT immerse the battery in water or allow it to get wet.
- DO NOT place the battery into a microwave oven or pressurized container.
- If the battery leaks or emits an odor, remove it from all possible flammable sources.
- If the battery emits an odor or heat, is deformed or discolored, or in a way appears abnormal during use, recharging or storage, immediately remove it and stop using it.

NOTE: If you have any questions about the battery, consult your local GE representative.

- Storage of the battery pack:
  Short-term (less than 1 month): between 0 °C (32 °F) and 50 °C (122 °F)

  Long-term (more than 3 months): between 10 °C (50 °F) and 35 °C (95 °F)

When charging the battery for the first time after long-term storage, recover the battery pack to original performance through repeating several cycles of full charging and discharging.

Section 1-5Labels Locations

1-5-1 The labels on the cover

The LOGIQ S8 comes equipped with product labels and icons.
These labels and icons represent pertinent information regarding the operation of the unit.

NOTE: The rating label is located on the rear of R1/R2/R3 system.

Figure 1-1 Label location - R1/R2/R3 system

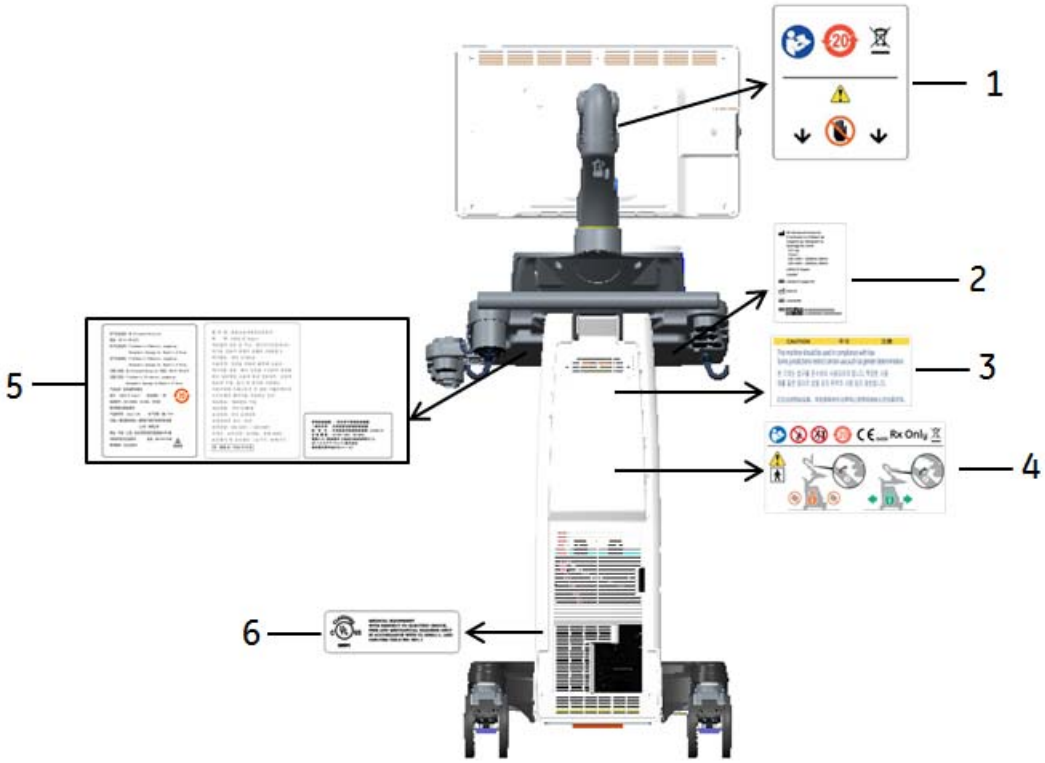


Figure 1-2 Label location - R4 and later system

1. LCD Caution label
2. LOGIQ S8 rating label
3. Gender Caution (only for India, China, Korea)
4. Multi Caution label
5. LOGIQ S8 Rating label (only for China, Korea, Japan)
6. UL label

*NOTE: * Depending on country, "Gender Label" is attached.*

1-5-1-1 WLAN label location (if WLAN option installed)

Figure 1-3 WLAN Label location (R1 to R3 system)

Figure 1-4 WLAN Label location (R4 and later system)

1-5-2 Rating plate

The following information prints on the rating plate.

1. Catalogue number
2. Manufacturing date
3. Manufacturer
4. System Serial Number
5. Power Supply Voltage
6. Power Input
7. Power Supply Frequency
8. Model Name

Rating plate UL label

Figure 1-5 Rating plate and UL label - example

NOTE: The rating label is located on the rear of R1/R2/R3 system.

Figure 1-6 Rating plate and UL label - R4 example

Section 1-6
Dangerous Procedure Warnings

Warnings, such as the examples below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

DANGER **DANGEROUS VOLTAGES, CAPABLE OF CAUSING DEATH, ARE PRESENT IN THIS EQUIPMENT. USE EXTREME CAUTION WHEN HANDLING, TESTING AND ADJUSTING.**

WARNING ***IF THE COVERS ARE REMOVED FROM AN OPERATING LOGIQ S8/LOGIQ E8, SOME METAL SURFACES MAY BE WARM ENOUGH TO POSE A POTENTIAL HEAT HAZARD IF TOUCHED, EVEN WHILE IN SHUT DOWN MODE.***

WARNING ***EXPLOSION WARNING***

DO NOT OPERATE THE EQUIPMENT IN AN EXPLOSIVE ATMOSPHERE. OPERATION OF ANY ELECTRICAL EQUIPMENT IN SUCH AN ENVIRONMENT CONSTITUTES A DEFINITE SAFETY HAZARD.

WARNING ***DO NOT SUBSTITUTE PARTS OR MODIFY EQUIPMENT.***

BECAUSE OF THE DANGER OF INTRODUCING ADDITIONAL HAZARDS, DO NOT INSTALL SUBSTITUTE PARTS OR PERFORM ANY UNAUTHORIZED MODIFICATION OF THE EQUIPMENT.

Section 1-7
Lockout/Tagout (LOTO) Requirements

Follow OSHA Lockout/Tagout requirements (USA) or local Lockout/Tagout requirements by ensuring you are in total control of the AC power plug at all times during the service process.

To apply Lockout/Tagout:

1.) Plan and prepare for shutdown.
2.) Shutdown the equipment.
3.) Isolate the equipment.
4.) Apply Lockout/Tagout Devices.
5.) Control all stored and residual energy.
6.) Verify isolation.
All potentially hazardous stored or residual energy is relieved.

NOTICE Energy Control and Power Lockout for LOGIQ S8

When servicing parts of the system where there is exposure to voltage greater than 30 Volts:
1. Remove the front cover and confirm the power status LED. If ON, then turn off the system.
2. Unplug the system.
3. Maintain control of the system power plug.
4. Wait for at least 20 seconds for capacitors to discharge as there are no test points to verify isolation. The Power On/Off button LED turns off.
5. Confirm the Power Status LEDs are OFF.
   - If the LEDs are turned ON, attempt to shut down the system again.
   - If unable to turn off the system, press and hold the POWER on/off button to force shutdown.

Section 1-8
Returning/Shipping System, Probes and Repair Parts

Equipment being returned must be clean and free of blood and other infectious substances.

GEHC policy states that body fluids must be properly removed from any part or equipment prior to shipment. GEHC employees, as well as customers, are responsible for ensuring that parts/equipment have been properly decontaminated prior to shipment. Under no circumstance should a part or equipment with visible body fluids be taken or shipped from a clinic or site (for example, body coils or and ultrasound probe).

The purpose of the regulation is to protect employees in the transportation industry, as well as the people who will receive or open this package.

NOTE: The US Department of Transportation (DOT) has ruled that "items what were saturated and/or dripping with human blood that are now caked with dried blood; or which were used or intended for use in patient care" are "regulated medical waste" for transportation purpose and must be transported as a hazardous material.

When returning or shipping the LOGIQ S8 system in the original packaging:

1.) Adjust the LCD monitor and control panel using Up/Down control and Swivel control to their centered and lowest positions.

2.) Flip down the LCD monitor and lock the monitor arm.

See 4-3-8 "Moving and Transporting the LOGIQ S8" on page 4-13 for more information.

NOTICE Equipment being returned must be clean and free of blood and other infectious substances.

1-8-1 For LOGIQ S8 Vet system

Return used/unused spare parts from a veterinary environment with the purple recycling label (regardless of its actual condition) and add a description on the label stating that the items were removed from a LOGIQ S8 Vet in a veterinary environment.

This apply for Probes and covers labeled as Vet used.

If purple recycling label is not used in your region, use local recycling label.

Section 1-9
Electromagnetic Compatibility (EMC) and Electrostatic Discharge (ESD)

1-9-1 What is EMC?

Electromagnetic compatibility describes a level of performance of a device within its electromagnetic environment. This environment consists of the device itself and its surroundings including other equipment, power sources and persons with which the device must interface. Inadequate compatibility results when a susceptible device fails to perform as intended due interference from its environment or when the device produces unacceptable levels of emission to its environment. This interference is often referred to as radio–frequency or electromagnetic interference (RFI/EMI) and can be radiated through space or conducted over interconnecting power of signal cables. In addition to electromagnetic energy, EMC also includes possible effects from electrical fields, magnetic fields, electrostatic discharge and disturbances in the electrical power supply.

For applicable standards please refer to Chapter 2 in the Basic User Manual of the each system.

1-9-2 Compliance

The LOGIQ S8 conforms to all applicable conducted and radiated emission limits and to immunity from electrostatic discharge, radiated and conducted RF fields, magnetic fields and power line transient requirements as mentioned in IEC 60601-1-2.

NOTE: ***For CE Compliance, it is critical that all covers, screws, shielding, gaskets, mesh, clamps, are in good condition, installed tightly without skew or stress. Proper installation following all comments noted in this service manual is required in order to achieve full EMC performance.***

1-9-3 Electrostatic Discharge (ESD) Prevention

WARNING ***DO NOT TOUCH ANY BOARDS WITH INTEGRATED CIRCUITS PRIOR TO TAKING THE NECESSARY ESD PRECAUTIONS.***

ALWAYS CONNECT YOURSELF, VIA AN ARM-WRIST STRAP, TO THE ADVISED ESD CONNECTION POINT LOCATED ON THE REAR OF THE SCANNER (NEAR THE POWER CONNECTOR).

FOLLOW GENERAL GUIDELINES FOR HANDLING OF ELECTROSTATIC SENSITIVE EQUIPMENT.

WARNING ***DO NOT touch any boards with integrated circuits prior to taking the necessary ESD precautions:***

1.) When installing boards, ESD may cause damage to a board.
ALWAYS connect yourself, via an arm-wrist strap, to the advised ESD connection point located on the rear of the system (to the right of the power connector).

2.) Follow general guidelines for handling of electrostatic sensitive equipment.

WARNING ***Risk of electrical shock: System must be turned off.***
Avoid all contact with electrical contacts, conductors and components.
Always use non-conductive handles designed for the removal and replacement of ESD sensitive parts. All parts that have the potential for storing energy must be discharged or isolated before making contact.

Section 1-10
Customer Assistance

1-10-1 Contact Information

If this equipment does not work as indicated in this service manual or in the Basic User Manual, or if you require additional assistance, please contact the local distributor or appropriate support resource, as listed below.

Before you call, identify the following information, and acquire image (Alt+D) to send to the Customer Care team:

1.) System ID serial number (also visible on label on back of the system).
2.) Software version.
3.) Date and time of occurrence.
4.) Sequence of events leading to issue.
5.) Is the issue repeatable?
6.) Imaging mode, probe, preset/application.
7.) Media brand, speed, capacity, type.
8.) Save secondary image capture, cine loop.

NOTE: Restart the application before resuming clinical scanning.

Table 1-8 Phone Numbers for Customer Assistance

Location	Phone Number	
USA GE Healthcare Ultrasound Service Engineering 9900 Innovation Drive (RP-2123) Wauwatosa, WI 53226, USA	Service On-site Service: Parts Applications support	1-800–437–1171 1-800-558-2040 1-800-682-5327 or 1-262-524-5698
Canada		1-800-668-0732
Latin America	Service Applications support	1-800-524-5300 1-262-524-5698
Europe GE Ultraschall Deutschland GmbH Beethovenstraße 239 Postfach 11 05 60, D-42655 Solingen Germany	Support Phone: +49 (0) 212-2802-652 Support Fax: +49 (0) 212-2802-431	
EAGM	Egypt Service Center UAE Service Center	00202 2322 1252 00971 8003646
Asia (Singapore) GE Ultrasound Asia Service Department - Ultrasound 1 Maritime Square #13-01 HarbourFront Centre Singapore 099253	Tel: 800 1012882 Fax: +65 6291-7006	
ANZ -Service Support	1800 647 855	
Japan Support Center	Phone: 81-42-648-2940 Fax: 81-42-648-2905	

Table 1-8 Phone Numbers for Customer Assistance

Location	Phone Number
China	86-800-810 8188 86-400-812 8188 86-10-6788 2652
India	1-800-425-8025 1-800-425-7255 1-800-102-7750

1-10-2 System Manufacturer

Table 1-9 System Manufacturer

Manufacturer	FAX Number
GE Ultrasound Korea 9, Sunhwan-ro 214beon-gil, Jungwon-gu, Seongnam-Si, Gyeonggi-do Korea	+82 (0) 31-740-6436

1-10-3 Authorized EU Representative

Table 1-10 Authorized EU Representative

Manufacturer	TEL/FAX Number
The location of the CE marking is shown in the Safety chapter of this manual. EC REP Authorized EU Representative European registered place of business: GE Medical Systems Information Technologies GmbH (GEMS IT GmbH) Munzinger Strasse 3, D-79111 Freiburg, GERMANY	+49 761 45 43 -0 / +49 761 45 43 -233

Chapter 2
Site preparations

Section 2-1
Overview

2-1-1 Purpose of this chapter

This chapter provides the information required to plan and prepare for the setup of a LOGIQ S8. Included are descriptions of the facility and electrical needs to be met by the purchaser of the unit.

2-1-2 Contents in this chapter

Section 2-2
General console requirements

2-2-1 Environmental Requirements

Table 2-1 System Environmental Requirements

	Operational	Storage	Transport
Temperature	10 - 35 ^{o}C /50 - 95 ^{o}F	-10 - 50 ^{o}C/14 - 122 ^{o}F	-10 - 50 ^{o}C/14 - 122 ^{o}F
Humidity	30 - 80% (non-condensing)	10 - 90% (non-condensing)	10 - 90% (non-condensing)
Pressure	700 - 1060 hPa	700 - 1060 hPa	700 - 1060 hPa
Heat Dissipation	680BTU/hr	n/a	n/a

2-2-1-1 Cooling

The cooling requirement for the LOGIQ S8 is 680 BTU/hr. This figure does not include cooling needed for lights, people, or other equipment in the room.

Each person in the room places an additional 300 BTU/hr. demand on the cooling system.

2-2-1-2 Lighting

Bright light is needed for system installation, updates and repairs. However, operator and patient comfort may be optimized if the room light is subdued and indirect. Therefore a combination lighting system (dim/bright) is recommended. Keep in mind that lighting controls and dimmers can be a source of EMI which could degrade image quality. These controls should be selected to minimize possible interference.

2-2-2 Electrical Requirements

2-2-2-1 General requirements

NOTE: GE Healthcare requires a dedicated power and ground for the proper operation of its Ultrasound system. This dedicated power shall originate at the last distribution panel before the system.

Sites with a mains power system with defined Neutral and Live:
The dedicated line shall consist of one phase, a neutral (not shared with any other circuit), and a full size ground wire from the distribution panel to the Ultrasound outlet.

Sites with a mains power system without a defined Neutral:
The dedicated line shall consist of one phase (two lines), not shared with any other circuit, and a full size ground wire from the distribution panel to the Ultrasound outlet.

NOTE: Please note that image artifacts can occur, if at any time within the facility, the Ground from the main facility's incoming power source to the Ultrasound system is only a conduit.

2-2-2-2 Electrical requirements

In the table below, the electrical specifications for LOGIQ S8 include LCD and on board peripherals.

Table 2-2 Electrical Specifications

Model	Voltage	Tolerances	Current	Frequency
LOGIQ S8	100 - 120 VAC	±10%	9.0 ... 7.0 A	50/60 Hz (±2%)
	220 - 240 VAC	±10%	4.0 ... 3.7 A	50/60 Hz (±2%)

Power Consumption nominal 900 VA including all on-board peripherals.

2-2-2-3 Inrush Current

Inrush current is not a factor to consider due to the inrush current limiting properties of the power supplies.

2-2-2-4 Site Circuit Breaker

It is recommended that the branch circuit breaker for the machine be readily accessible.

CAUTION POWER OUTAGE MAY OCCUR.

The LOGIQ S8 requires a dedicated single branch circuit. To avoid circuit overload and possible loss of critical care equipment, make sure you DO NOT have any other equipment operating on the same circuit.

2-2-2-5 Site Power Outlets

A dedicated AC power outlet must be within reach of the unit without extension cords. Other adequate outlets for the external peripherals, medical and test equipment needed to support this unit must also be present within 1 m (3.2 ft.) of the unit. Electrical installation must meet all current local, state, and national electrical codes.

2-2-2-6 Power Plug

The LOGIQ S8 is supplied with a main power plug, as standard.

If the unit arrives without a power plug, or with the wrong plug, you must contact your GE dealer or the installation engineer must supply what is locally required.

2-2-3 EMI Limitations

Ultrasound systems are susceptible to Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transients in the air or wiring. Ultrasound systems also generate EMI. The LOGIQ S8 complies with limits as stated on the EMC label. However, there is no guarantee that interference will not occur in a particular installation.

Possible EMI sources should be identified before the unit is installed.

Electrical and electronic equipment may produce EMI unintentionally as the result of a defect. These sources include:

- Medical lasers
- Scanners
- Cauterizing guns
- Computers
- Monitors
- Fans
- Gel warmers
- Microwave oven
- Light dimmers
- Mobile phones
- In-house wireless phones (DECT phones)
- Wireless computer keyboard and mouse
- Air conditioning system
- High frequency (HF) surgery equipment
- General AC/DC adapters

The presence of a broadcast station or broadcast van may also cause interference.

See table below for EMI Prevention tips.

Table 2-3 EMI Prevention/Abatement

EMI Rule	Details
Be aware of RF sources.	Keep the unit at least 5 meters (16.4 feet) away from other EMI sources. Special shielding may be required to eliminate interference problems caused by high frequency, high powered radio or video broadcast signals.
Ground the unit.	Poor grounding is the most likely reason a unit will have noisy images. Check grounding of the power cord and power outlet.
Replace and/or reassemble all screws, RF gaskets, covers and cores.	After you finish repairing or updating the system, replace all covers and tighten all screws. Any cable with an external connection requires a magnet wrap at each end. Install the shield over the front of card cage. Loose or missing covers or RF gaskets allow radio frequencies to interfere with the ultrasound signals.
Replace broken RF gaskets.	If more than 20% or a pair of the fingers on an RF gasket are broken, replace the gasket. Do not turn ON the unit until any loose metallic part is removed and replaced, if required.
Do not place labels where RF gaskets touch metal.	Never place a label where RF gaskets meet the unit. Otherwise, the gap created will permit RF leakage. In case a label has been found in such a location, move the label to a different, appropriate location.
Use GE- specified harnesses and peripherals.	The interconnect cables are grounded and require ferrite beads and other shielding. Cable length, material, and routing are all important; do not make any changes that do not meet all specifications.
Take care with cellular phones.	Cellular phones may transmit a 5 V/m signal that causes image artifacts.
Properly dress peripheral cables.	Do not allow cables to lie across the top of the card cage or hang out of the peripheral bays. Loop the excess length for peripheral cables inside the peripheral bays. Attach the monitor cables to the frame.

2-2-4 Probe Environmental Requirements

Probes should be operated, stored, or transported within the parameters outlined below.

NOTE: See attached TEE probe user manual for the environmental requirements of 6Tc-RS probe.

NOTE: See attached FibroScan user manual for the environmental requirements of FibroScan probe.

Table 2-4 Probe Environmental Requirements

	Probe	Operation	Storage	Transport
Temperature	2D probe	10° - 35° C/50° - 95° F	-40° - 60° C/-40° - 140° F	
	10C-D		-10°- 55° C/14°-131° F	-40° - 55° C/-40° - 131° F
	4D probe	18° - 30° C/64.4° - 86° F	-10° - 50° C/14° - 122° F	
Humidity	2D probe	10 - 90% non-condensing		
	4D probe	30 - 75% non-condensing	10 - 85% non-condensing	
Pressure	2D/4D probe	700 - 1060hPa		
	10C-D	680 - 1060hPa		

NOTICE WHEN EXPOSED TO LARGE TEMPERATURE VARIATIONS, THE PRODUCT SHOULD BE KEPT IN ROOM TEMPERATURE FOR 10 HOURS BEFORE USE.

NOTE: Refer to Table 3-2 Acclimate Time on page 3-4 to determine the needed settlement time.

2-2-5 Time and Manpower Requirements

Site preparation takes time. Begin Pre-installation checks as soon as possible. If possible, allow six weeks before delivery, for enough time to make necessary changes.

CAUTION Have two people available to deliver and unpack the LOGIQ S8.

Attempts to move the unit considerable distances (or on an incline) by one person alone, could result in personal injury and/or damage to the system.

Section 2-3
Facility needs

2-3-1 Purchaser Responsibilities

The work and materials needed to prepare the site is the responsibility of the purchaser. Delay, confusion, and waste of manpower can be avoided by completing pre installation work before delivery. Purchaser responsibility includes:

- Procuring the materials required.
- Completing the preparations before delivery of the ultrasound system.
- Paying the costs for any alterations and modifications not specifically provided in the sales contract.

NOTE: All electrical installations that are preliminary to the positioning of the equipment at the site prepared for the equipment must be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations, and testing must also be performed by qualified personnel. The products involved (and the accompanying electrical installations) are highly sophisticated and special engineering competence is required. All electrical work on these products must comply with the requirements of applicable electrical codes. The purchaser of GE equipment must only utilize qualified personnel to perform electrical servicing on the equipment.

The desire to use a non–listed or customer provided product or to place an approved product further from the system than the interface kit allows presents challenges to the installation team. To avoid delays during installation, such variances should be made known to the individuals or group performing the installation at the earliest possible date (preferably prior to the purchase).

The ultrasound suite must be clean prior to delivery of the machine. Carpet is not recommended because it collects dust and creates static. Potential sources of EMI (electromagnetic interference) should also be investigated before delivery. Dirt, static, and EMI can negatively impact system reliability.

2-3-2 Required Facility Needs

NOTE: GE Healthcare requires a dedicated power and ground for the proper operation of its Ultrasound system. This dedicated power shall originate at the last distribution panel before the system.

Sites with a mains power system with defined Neutral and Live:
The dedicated line shall consist of one phase, a neutral (not shared with any other circuit), and a full size ground wire from the distribution panel to the Ultrasound outlet.

Sites with a mains power system without a defined Neutral:
The dedicated line shall consist of one phase (two lines), not shared with any other circuit, and a full size ground wire from the distribution panel to the Ultrasound outlet.

The following are mandatory site requirements. Additional (optional) recommendations, as well as a recommended ultrasound room layout, are provided in Section 2-3-4 "Desirable features" .

- Dedicated single branch power outlet of adequate amperage (see Table 2-2 Electrical Specifications on page 2-3) that meets all local and national codes and is located less than 2.5 m (8.2 ft.) from the LOGIQ S8 proposed location.
- Door opening of at least 76 cm (2.5 ft.) in width.
- Proposed location for the LOGIQ S8 is at least 0.2 m (0.67 ft.) from the walls, to enable cooling.
- Power outlet and place for any external peripheral are within 2 m (6.5 ft.) of each other with peripheral within 1 m of the unit to connect cables.
- Power outlets for other medical equipment.
- Clean and protected space for storage of probes (either in their case or on a rack).
- Material to safely clean probes (performed using a plastic container, never metal).

NOTE: The LOGIQ S8 has one outlet for on board peripherals.

In case of network option:

- An active network outlet in the vicinity of the ultrasound unit.
- A network cable of appropriate length (regular Pin-to-Pin network cable).
- An IT administrator who will assist in configuring the unit to work with your local network.

  A fixed IP address is required. Refer to the form provided in Figure 3-61 Worksheet for DICOM Network Information on page 3-96 for network details that are required.

NOTE: All relevant preliminary network port installations at the prepared site must be performed by authorized contractors. The purchaser of GE equipment must utilize only qualified personnel to perform servicing of the equipment.

2-3-3 Privacy and Security

Since the LOGIQ systems are integrated into your IT-network, GE wants to make sure that you are aware of the proactive measures we are taking to secure the system.

For more information on privacy and security, refer to LOGIQ S8 Privacy and Security manual in eDoc CD.

2-3-4 Desirable features

The followings are (optional) site recommendations.

- Door opening of at least 76 cm (2.5 ft.) in width.
- Accessible circuit breaker for a dedicated power outlet.
- Sink with hot and cold running water.
- Receptacle for bio–hazardous waste, for example, used probe sheaths.
- Emergency oxygen supply.
- Storage area for linens and equipment.
- Nearby waiting room, lavatory, and dressing room.
- Dual level lighting (bright and dim).
- Lockable cabinet for software and manuals.

2-3-5 Minimal floor plan suggestions

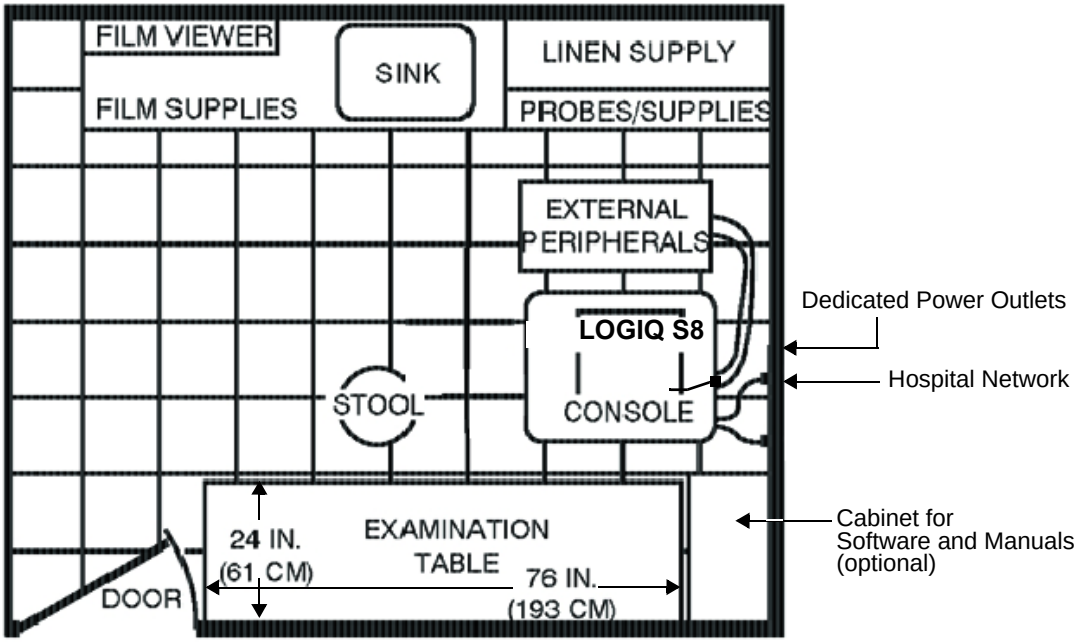


Figure 2-1 Minimal Floor Plan 4.3m x 5.2m (14ft x 17ft)

2-3-6 Networking setup requirements

For detail of Connectivity setup information, refer to the Basic User Manual supplied with the each system.

2-3-6-1 Stand alone scanner (without network connection)

None.

2-3-6-2 Scanner connected to hospital's network

Supported networks:

- Ethernet network connection (R1.x.x/R2 and later)
- Up to 900 Mbps WLAN (R2 and later, optional)
- 10/100/1000 Mbps Ethernet/DICOM network connection is required.

2-3-6-3 InSite Requirements

Need internet access available to be able to connect to Insite.

Insite requires an Ethernet connection with a 10/100 Mbps or 10/100/1000 Mbps interface.

2-3-6-4 Purpose of the DICOM network function

DICOM services provide the operator with clinically useful features for moving images and patient information over a hospital network.

Examples of DICOM services include the transfer of images to workstations for viewing or transferring images to remote printers.

As an added benefit, transferring images in this manner frees up the on-board LCD and peripherals, enabling viewing to be done while scanning continues.

With DICOM, images can be archived, stored, and retrieved faster, easier, and at a lower cost.

2-3-6-5 DICOM Option Pre-installation Requirements

To configure the LOGIQ S8 to work with other network connections, the site's network administrator must provide information to complete the form in Figure 2-2 Worksheet for DICOM Network Information on page 2-11. Ensure that there are no spaces in any field of the form.

Entries must include:

- A host name, local port number, AE Title, IP address and Net Mask for the LOGIQ S8.
- The IP addresses for the default gateway and other routers at the site for ROUTING INFORMATION.
- The host name, IP address, port and AE Title for each device the site wants connected to the LOGIQ S8 for DICOM APPLICATION INFORMATION. A field for the make (manufacturer) and the revision of the device, is also included. This information may be useful for error solving.

2-3-6-5 DICOM Option Pre-installation Requirements (cont'd)

Figure 2-2 Worksheet for DICOM Network Information

Site System Information

Site:

Dept:

LOGIQ™ S8 SN:

Type:

Floor:

Room:

REV:

Comments:

CONTACT INFORMATION

Name	Title	Phone	E-Mail Address

TCP/IP Settings

System IP Settings

Name - AE Title:

IP Address:

Subnet Mask:

Default Gateway:

Remote Archive Setup

Name - AE Title:

IP Address:

Subnet Mask:

Default Gateway:

Server Name:

Remote DB User Name:

Services (Destination Devices)

	Device Type	Manufacturer	Name	IP Address	Port	AE Title
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

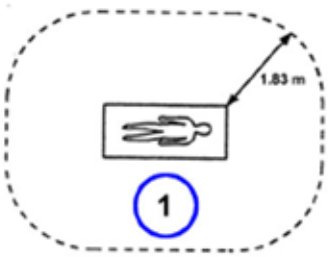
Section 2-4
Environmental Dangers

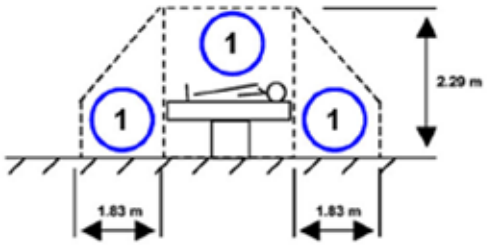
Commercial devices such as laser cameras, printers, VCRs and external monitors, usually exceed allowable leakage current limits and, when plugged into separate AC outlets, are in violation of patient safety standards. Suitable electrical isolation of such external AC outlets, or providing the device with extra protective earth, will be required in order to meet UL60601-1 and IEC60601-1 / IEC60601-1-1 standards for electrical leakage.

2-4-1 Patient Vicinity UL60601-1 (USA)

2.12.20DV (UL60601-1:2003)

In area in which patients are normally cared for, the patient vicinity is the space with surfaces likely to be contacted by the patient or attendant who can touch the patient. This encloses a space within the room 1.83 m (6 ft.) beyond the perimeter of the bed (examination table, dental chair, treatment booth, and the like) in its intended location, and extending vertically 2.29 m (7.5 ft.) above the floor.





1. Patient environment

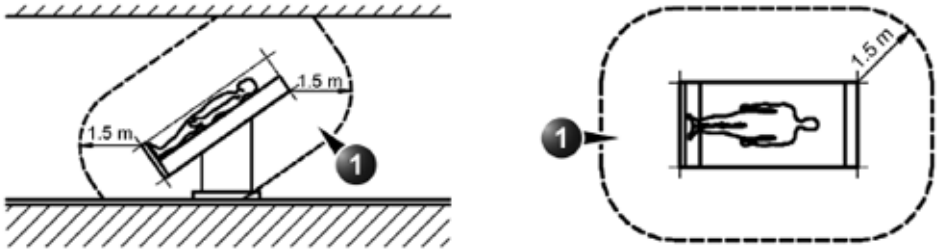
2-4-2 Patient Environment IEC60601-1 (IEC60601-1-1) and ANSI AAMI ES60601-1

Sub Clause 2.202 and figure 201 (IEC60601-1-1:2000)

Sub Clause 3.79 and figure A.9 (IEC60601-1:2005 and ANSI AAMI ES60601-1:2005)

Such an area is an environment in which medical diagnosis, monitoring or treatment is carried out. It is very difficult to attach unique dimensions to the PATIENT ENVIROMENT. In practice, a distance of 2,5 m (8.2 ft.) above the floor on which the medical personnel stand and a horizontal distance of 1,5 m (4.9 ft.) have justified themselves as indicative of the dimensions of the Patient Environment.

The patient environment/vicinity will be depicted as a dashed line in this procedure. See example below.



1. Patient environment

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Chapter 3
System Setup

Section 3-1
Overview

3-1-1 Purpose of this chapter

This chapter contains information needed to set up the LOGIQ S8. Included is a procedure that describes how to receive and unpack the equipment and how to file a damage or loss claim.

How to prepare the facility and unit of the actual setup, and how to check and test the unit, probes, and external peripherals for electrical safety are included in this procedure.

3-1-2 Contents in this chapter

Section 3-2
Setup reminders

3-2-1 Average Setup Time

Once the site has been prepared, the average installation time required is shown in table below.

Table 3-1 Average Installation Time

Description	Average Setup Time	Comments
Unpacking the scanner	0.5 hours	
Setup the scanner / options / printers	0.5 to 1.5 hours	Dependent on the configuration
DICOM Option (connectivity)	0.5 - 1.5 hours	Dependent on the configuration
Install Insite/iLink	0.5 hours	

3-2-2 Setup warnings

DANGER **WHEN USING ANY TEST INSTRUMENT THAT IS CAPABLE OF OPENING THE AC GROUND LINE (I.E., METER'S GROUND SWITCH IS OPEN), DON'T TOUCH THE UNIT!**

WARNING **DO NOT PULL OR LIFT THE SYSTEM WITH THE FRONT HANDLE OF THE USER INTERFACE (OPERATOR PANEL).**

WARNING **THE SYSTEM SHOULD NOT BE MOVED WITH THE OPERATOR CONTROL PANEL EXTENDED. MOVE THE OPERATOR CONTROL PANEL TO IT'S CENTERED AND LOCKED POSITION. REFER TO Section 8-2-3 "Returning/Shipping Probes and Repair Parts" on page 8-4.**

CAUTION **TO PREVENT ELECTRICAL SHOCK, CONNECT THE UNIT TO A PROPERLY GROUNDED POWER OUTLET. DO NOT USE A THREE TO TWO PRONG ADAPTER. THIS DEFEATS SAFETY GROUNDING.**

CAUTION **DO NOT WEAR THE ESD WRIST STRAP WHEN YOU WORK ON LIVE CIRCUITS AND MORE THAN 30 V PEAK IS PRESENT.**

CAUTION **DO NOT OPERATE THIS ULTRASOUND SYSTEM UNLESS ALL BOARD COVERS AND FRAME PANELS ARE SECURELY IN PLACE. SYSTEM PERFORMANCE AND COOLING REQUIRE THIS.**
(When covers are removed, EMI may be present).

CAUTION **OPERATOR MANUAL(S)**
THE USER MANUAL(S) SHOULD BE FULLY READ AND UNDERSTOOD BEFORE OPERATING THE LOGIQ S8/LOGIQ E8 AND KEPT NEAR THE UNIT FOR QUICK REFERENCE.

CAUTION **ACOUSTIC OUTPUT HAZARD**
ALTHOUGH THE ULTRASOUND ENERGY TRANSMITTED FROM THE LOGIQ S8 PROBE IS WITHIN AIUM/NEMA STANDARDS, AVOID UNNECESSARY EXPOSURE. ULTRASOUND ENERGY CAN PRODUCE HEAT AND MECHANICAL DAMAGE.

- The system weighs approximately 85 kg (LOGIQ S8) / 97 kg (LOGIQ E8) without peripherals, two people are required to unpack it.
- There are no operator serviceable components. To prevent shock, do not remove any covers or panels. Should problems or malfunctions occur, unplug the power cord. **Only** qualified service personnel should carry out servicing and troubleshooting.

3-2-2-1 If the unit is very cold or hot

CAUTION **Turning the system ON after arrival at the site - without allowing time for acclimation - may cause system damage!**

Following transport, the system may be very cold, or hot. Allow time for the system to acclimate before being switched ON. Acclimation requires 1 hour for each 2.5^{o}C increment, when the temperature of the system is below 10^{o}C or above 40^{o}C..

Table 3-2 Acclimate Time

^{o}C	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	45	50	55	60
^{o}F	-40	-31	-22	-13	-4	5	14	23	32	41	50	59	68	77	86	95	104	113	122	131	140
Hrs	20	18	16	14	12	10	8	6	4	2	0	0	0	0	0	0	0	2	4	6	8

NOTE: After a long period of storage, or after transportation of the system with the monitor in the folded-down position, it is highly recommended to place the monitor in the upright position - and to leave it in this position for a period of longer than 1 hour before use. This will enable it to properly adjust to the environmental conditions.

Section 3-3
Receiving and unpacking the equipment

3-3-1 Receiving and unpacking warnings

WARNING **DO NOT PULL OR LIFT THE SYSTEM WITH THE FRONT HANDLE OF THE USER INTERFACE (OPERATOR PANEL).**

CAUTION **Two people are needed to unpack the unit because of its weight. Attempts to move the unit considerable distances or on an incline by one person could result in injury or damage or both.**

Two people are required whenever a part weighing 16 kg (35 lbs.) or more must be lifted.

CAUTION **Remember to use relevant personal protecting equipment (pre) during packing/unpacking. Check with your local EHS representative.**

3-3-2 Receiving the LOGIQ S8

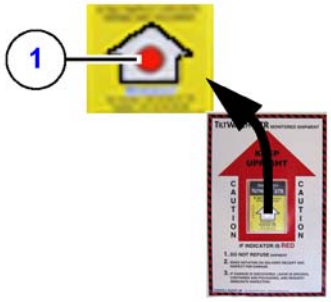
3-3-2-1 Overview

Improper handling during transportation may harm the equipment inside the package even if the package itself is undamaged.

3-3-2-2 Examine package

Examine package closely at time of delivery.

Table 3-3 Examine all packages

STEP	TASK	
1	Is damage apparent? If YES, continue with the instruction in Section 3-3-2-3 "Damage in transportation" on page 3-6. If NO, continue with the next step.	
2	Before cutting the straps, check the tilt indicator. Is the tilt Indicator red colored (1) inside the middle of the indicator? • If YES: The tilt Indicator has been activated. Continue with the instructions in Section 3-3-2-3 "Damage in transportation" on page 3-6. • If NO: continue with the instruction in Section 3-3-4 "Unpacking the LOGIQ S8" on page 3-9.	

3-3-2-3 Damage in transportation

Follow this procedure if damage is apparent:

Table 3-4 Damage in transportation

STEP	TASK
1	Write “Damage In Shipment” on ALL copies of the freight or express bill BEFORE delivery is accepted or “signed for“ by a GE representative or hospital receiving agent.
2	Report the damage to the carrier. • Whether noted or concealed, damage MUST be reported to the carrier immediately upon discovery, or in any event, within 14 days after receipt, and the contents and containers held for inspection by the carrier. • A transportation company will not pay a claim for damage if an inspection is not requested within this 14 day period.

3-3-2-4 The Tilt & Shock indicators (if applied)

NOTE: Tilt and Shock Indicators are removed in later product shipments.

3-3-2-4-1 Overview

Improper handling during transportation may harm the equipment inside the package even if the package itself is undamaged.

To make it easier to detect if the handling during transportation has been improper, a set of Tilt & Shock indicators have been attached to the transportation box.

3-3-2-4-2 Position of the Tilt & Shock indicators

Inspect the Drop and Tilt Indicator for evidence of accidental shock or tilting during transit (damage incident, as illustrated in the figure below.

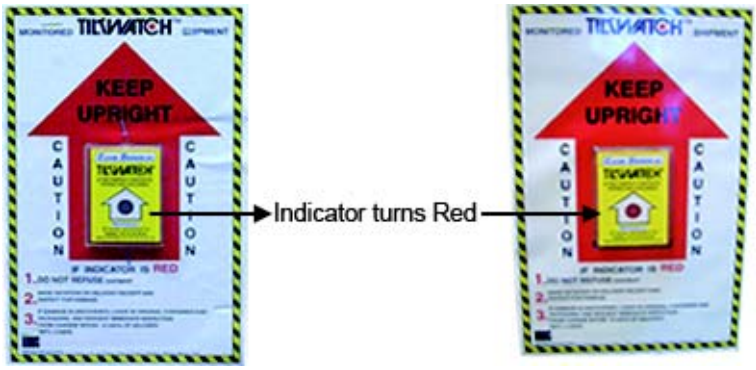


Figure 3-1 Tilt & Shock indicators

NOTE: Before cutting the straps, check the Shock and Tilt Tags to make sure they have not been triggered. If damaged, report it to the carrier. If not, then cut the straps around the crate.

3-3-3 Transportation Box Label

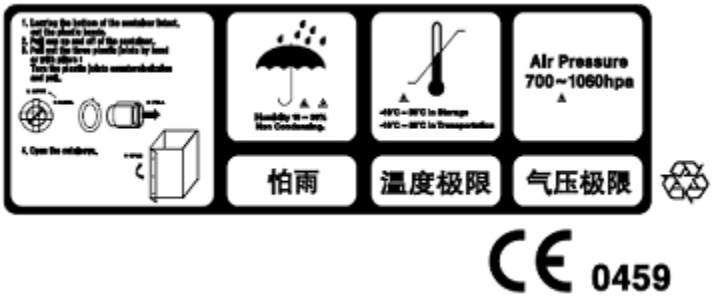


Figure 3-2 Label 1

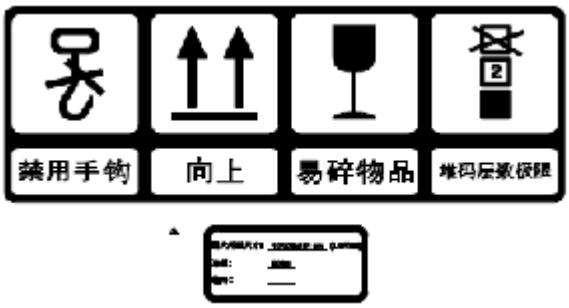


Figure 3-3 Label 2

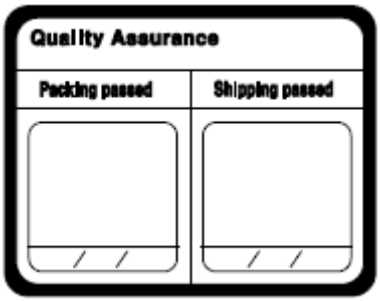


Figure 3-4 Label 3

3-3-4 Unpacking the LOGIQ S8

The instruction manual describes the best method for unpacking the LOGIQ S8 ultrasound scanning unit. Images are ONLY for reference; wear proper PPE when handling packaging (gloves, safety shoes, etc....).

Table 3-5 Unpacking Procedure

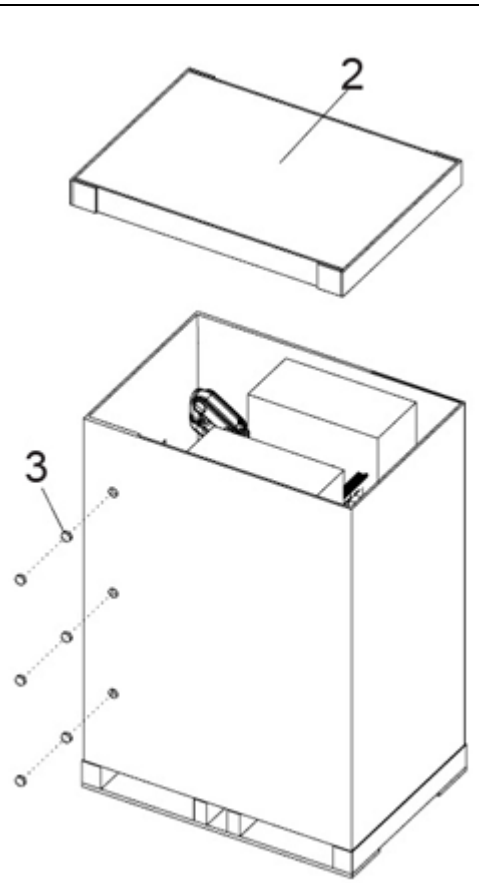
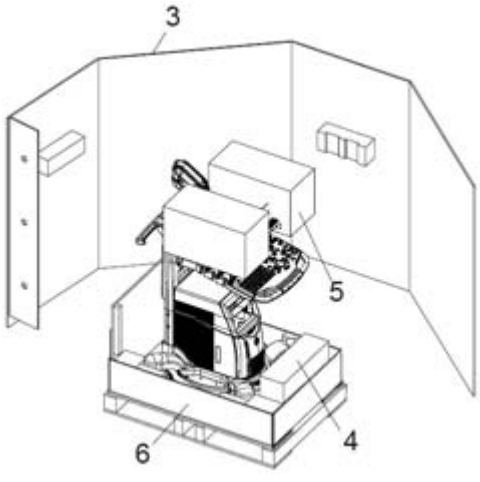
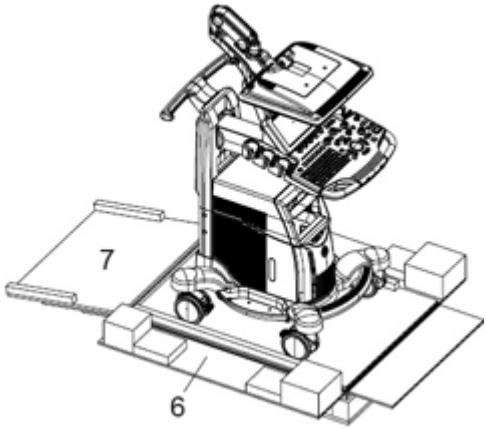
Step	Task	
1.	Cut the straps around the crate.	
2.	Remove the top cover.	
3.	Remove three P-Joint, then remove the out sleeve.	
4.	Remove the option box.	
5.	Carefully remove foam packing material and plastic bag from the ultrasound unit and monitor	
6.	Remove the box bottom assy..	

Table 3-5 Unpacking Procedure

Step	Task	
7.	Unlock the casters and align the orientation of the 4 caster's direction (refer to 4-3-7 "Caster" on page 4-11) and then using the incline plane of the box bottom assy., slowly move the system from the box.	
Note: Place all of the filling inside the Transportation Box. Close the box, and store the filling for possible future use.		

Section 3-4
Packing materials - recycling information

The packing materials for LOGIQ S8 are recyclable:

- The Transportation Box is made of cardboard.
- The inner reinforcements are made of Ethafoam (Polyethylene foam).
- The plastic foil is made of LDPE (Low Density Polyethylene).

Section 3-5
Preparing for setup

3-5-1 Verify Customer Order

Compare all items listed on the packing slip (delivery note) with those received.
Report any items that are missing, back ordered, or damaged.

The envelope with delivery address, packing list and invoice is located on the front panel of the crate.

Check whether delivery is complete (according to packing list) and check visual damage!

Figure 3-5 envelope at front panel of the crate

3-5-2 Physical inspection

Verify that the system arrived intact (visual inspection).

If the system has been damaged, please refer to 3-3-2-3 "Damage in transportation" on page 3-6 in the beginning of this manual.

3-5-3 EMI Protection

This unit has been designed to minimize the effects of Electo-Magnetic Interference (EMI). Many of the covers, shields, and screws are provided primarily to protect the system from image artifacts caused by this interference. For this reason, it is imperative that all covers and hardware are installed and secured before the unit is put into operation.

Refer to Section 2-2-3 "EMI Limitations" on page 2-4.

Section 3-6
Completing the Set Up

3-6-1 System Specifications

3-6-1-1 System requirements verification

- Verify that the site meets the requirements listed in (see: Section 2-3 "Facility needs" on page 2-7).
- Verify that the specifications below don't conflict with any on-site conditions.

3-6-1-2 Physical Dimensions

Table 3-6 LOGIQ S8 R1 to R3 (without Peripherals)

Height	Width	Depth	Weight
1720 mm, 67.7 in (max) 1150 mm, 45.3 in (min) *	500 mm, 19.7 in (Keyboard) 620 mm, 24.4 in (Caster)	865 mm, 34.1 in (max) 795 mm, 31.3 in (Caster)	85 kg (187.4 lbs.)

* with low cabinet option.

Table 3-7 LOGIQ S8 R4 and later (without Peripherals)

Height	Width	Depth	Weight
1760 mm, 69.3 in (max) 1150 mm, 45.3in (min, 23" LCD) 1100 mm, 43.3in (min, 22" OLED)	520 mm, 20.5 in (Keyboard) 530 mm, 20.9 in (Caster) 561 mm, 22.1 in (23" LCD Monitor) 527mm, 20.7in (22" OLED Monitor)	865 mm, 34.1 in (max) 795 mm, 31.3 in (Caster)	85 kg (187.4 lbs.)

Table 3-8 LOGIQ E8 R2 and R3 (without Peripherals)

Height	Width	Depth	Weight
1750 mm (max) 1250 mm (min)	500 mm (Keyboard) 620 mm (Caster)	865 mm (max) 795 mm (Caster)	97 kg

Table 3-9 LOGIQ E8 R4 and later (without Peripherals)

Height	Width	Depth	Weight
1760 mm (max) 1240 mm (min)	520 mm (Keyboard) 530 mm (Caster) 527mm (22" OLED Monitor)	865 mm (max) 795 mm (Caster)	97 kg

3-6-1-3 Acoustic Noise Output

max. 50 dB(A)

3-6-2 Electrical specifications

WARNING **CONNECTING A LOGIQ S8 TO THE WRONG VOLTAGE LEVEL WILL MOST LIKELY DESTROY THE UNIT.**

3-6-2-1 Verification of the LOGIQ S8's voltage setting

Verify that the mains voltage specified for the unit is available on-site.

The voltage setting for the unit is found on a label on the back of the system on lower rear frame of the LOGIQ S8.

3-6-2-2 Electrical Specifications

In the table below, the electrical specifications for LOGIQ S8 include LCD and on board peripherals.

Table 3-10 Electrical Specifications

Model	Voltage	Tolerances	Current	Frequency
LOGIQ S8	100 - 120 VAC	±10%	9.0 ... 7.0 A	50/60 Hz (±2%)
	220 - 240 VAC	±10%	4.0 ... 3.7 A	50/60 Hz (±2%)

Power Consumption nominal 900 VA including all on-board peripherals.

3-6-3 Connection the I/O Rear Panel

Accessory equipment connected to the analog and digital interfaces must be certified according to the respective IEC standards (i.e., IEC60950 for data processing equipment and IEC60601-1 for medical equipment). Furthermore, all complete configurations shall comply with the valid version of the system standard IEC60601-1-1. Everyone who connects additional equipment to the signal input part or signal output part of the LOGIQ S8 system configures a medical system, and is therefore responsible to ensure that the system complies with the requirements of the valid version of IEC60601-1-1. If in doubt, consult the technical service department or your local GE Healthcare representative.

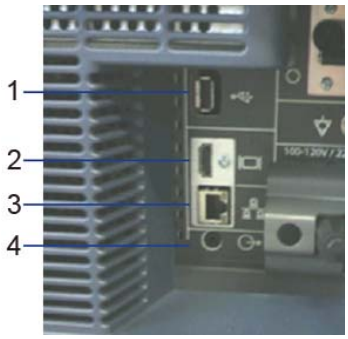


Figure 3-6 External I/O Connectors - on Rear of System

Table 3-11 External I/O Connector - Description

Item	Connector Name	Section number	Description
1	USB Port	5-2-3-2	R1/R2: USB2.0 Full Speed (Isolated) R3/R4: USB2.0 Full Speed (No isolated)
2	HDMI Connector	5-2-4-1	Connector for external Monitor.
3	Ethernet	5-2-4-2	LAN for InSite Connection (RJ45).
4	AUDIO	5-2-4-3	Connector for External Speaker. Audio line out (3.5mm pin jack)

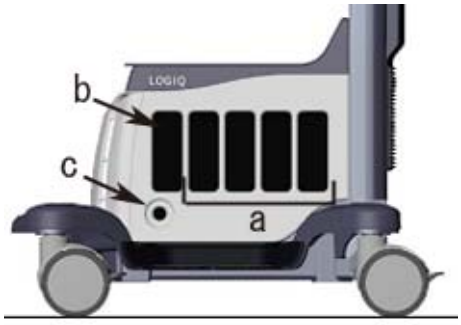
3-6-4 Connecting Probes

3-6-4-1 Introduction

Probes can be connected at any time, regardless of whether the unit is on or off. To ensure that the ports are not active, place the system in the image freeze condition

.

LOGIQ S8/LOGIQ S8 Vet



a. Active probe port
b. Parking probe port
c. Pencil probe port

LOGIQ E8

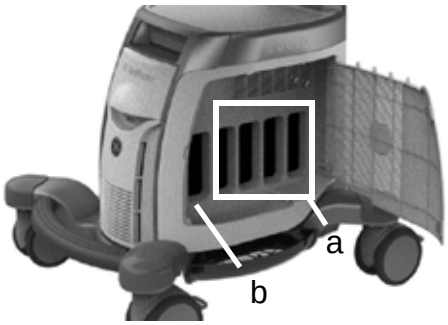


Figure 3-7 Probe port

3-6-4-2 Cable Handling

Take the following precautions with probe cables:

- Keep free from wheels
- Do not bend the cable acutely
- Avoid crossing cables between probes.

3-6-4-3 Connect a probe

CAUTION **DO NOT use a probe which appears damaged until functional and safe performance is verified.**

CAUTION **Fault conditions can result in electric shock hazard. Do not touch the surface of probe connectors which are exposed when the probe is removed.**

CAUTION **DO NOT allow the probe head to hang free. Impact to the probe head could result in irreparable damage.**

1.) Before connecting the probe:
   a.) Do a visual check of the probe pins and system sockets.
   b.) Remove any dust or foam rests from the probe pins.
   c.) Inspect the probe for damage or degradation to the housing, strain relief, lens, seal, cable and connector.
2.) Put the probe in the probe holder. Use the integrated cable management hook to wrap the cord.
3.) Ensure that the probe locking handle is at horizontal position.
4.) Hold the probe connector vertically with the cable pointing upward.
5.) Align the connector with the probe port and carefully push into place.
6.) Turn the connector locking handle clockwise (to vertical position) to secure the probe connector.
7.) Carefully position the probe cable so it is free to move and is not resting on the floor.

3-6-4-4 Connecting the CW Pencil Probe (LOGIQ S8/LOGIQ S8 Vet)

Insert the probe connector into the pencil probe port all the way seated in. Carefully position the probe cable so it is free to move and is not resting on the floor.

3-6-4-5 Connecting the TEE Probe

Type of this connector is “RS”, connect to the system by TEE probe adapter.

TEE RS-DLP probe adapter has 2 connection ports. One is “RS” type for TEE probe, the other is “DLP” type for LOGIQ S8 system.

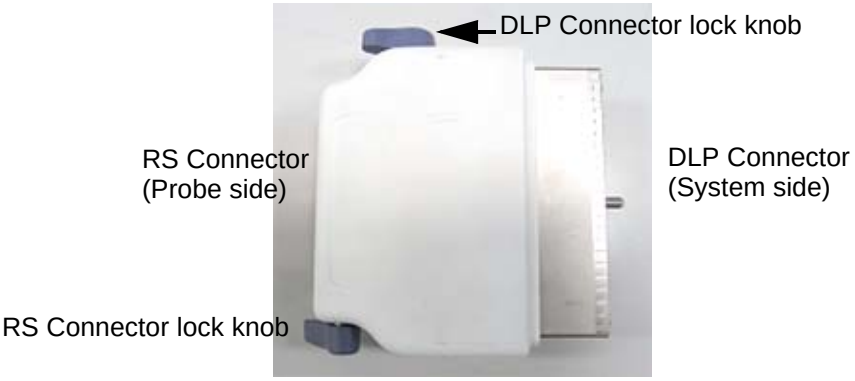


Figure 3-8 DLP-RS Connector

1.) Hold the probe connector and TEE DLP-RS adapter with the cable pointing DLP connector lock knob.

2.) Turn the RS connector lock knob to release side.

Figure 3-9 Lock/Release position

3.) Align the connector with the RS port and carefully push into place.

4.) Turn the RS connector lock knob to the lock side.

5.) Hold the adapter + probe connector vertically with the cable pointing upward.

6.) Turn the DLP connector lock knob to lock side to secure the probe connector.

7.) Carefully position the probe cord so it is free to move and is not resting on the floor.

Section 3-7
Power On/Off

DANGER **ALWAYS CONNECT THE UNIT TO A FIXED POWER SOCKET WHICH HAS THE PROTECTIVE GROUNDING CONNECTOR.**

DANGER **NEVER USE A THREE-TO-TWO PRONG ADAPTER; THIS DEFEATS THE SAFETY GROUND.**

DANGER **ENSURE THAT THE POWER CORD AND PLUG ARE INTACT AND THAT THE POWER PLUG IS THE PROPER HOSPITAL-GRADE TYPE (WHERE REQUIRED).**

CAUTION **LOGIQ S8 REQUIRES ALL COVERS.**

OPERATE THIS UNIT ONLY WHEN ALL BOARD COVERS AND FLAME PANELS ARE SECURELY IN PLACE. THE COVERS ARE REQUIRED FOR SAFE OPERATION, GOOD SYSTEM PERFORMANCE AND COOLING PURPOSES.

NOTICE User only power supply cords, cables and plugs provided by or designated by GE Healthcare.

NOTICE After turning off the system, wait at least 10 seconds before turning it on again. The system may not be able to boot if power is recycled too quickly.

NOTE: *If the battery option is installed (R4 or later)*

The extended battery/small battery is charged automatically when the LOGIQ S8 is connected to the wall outlet via the power cable and circuit breaker is turned on whether the LOGIQ S8 is turned on or in standby-mode.

But you can turn off the circuit breaker and disconnect the power cable when the battery is charging.

- While the extended battery/small battery charging, a fan is running. a fan stops automatically when battery is fully charged.
- While the extended battery charging, the LED is blinking and turn off when the battery is fully charged.

3-7-1 Connect AC (mains) Power to the LOGIQ S8

Connecting AC Power to the LOGIQ S8 involves preliminary checks of the power cord, voltage level and compliance with electrical safety requirements.

WARNING ***POWER OUTAGE MAY OCCUR. THE ULTRASOUND UNIT REQUIRES A DEDICATED SINGLE BRANCH CIRCUIT. TO AVOID CIRCUIT OVERLOAD AND POSSIBLE LOSS OF CRITICAL CARE EQUIPMENT, MAKE SURE YOU DO NOT HAVE OTHER EQUIPMENT OPERATING ON THE SAME CIRCUIT.***

CAUTION **Disconnect the plug from the wall outlet in case an emergency should occur. Ensure easy access to the power outlet.**

1.) Ensure that the wall outlet is of appropriate type, and that the Circuit Breaker is turned off.
2.) Uncoil the power cable, allowing sufficient slack so that the unit can be moved slightly.
3.) Verify that the power cable is without any visible scratches or any sign of damage.
4.) Verify that the on-site mains voltage is within the limits indicated on the rating label on the right side of the rear panel.
5.) Connect the Power Cable's female plug to the Power Inlet at the rear of the unit.
6.) Lock the plug in position with the Retaining Clamp.
7.) Verify that the Mains Power Circuit Breaker is in OFF position, if not, switch it OFF.

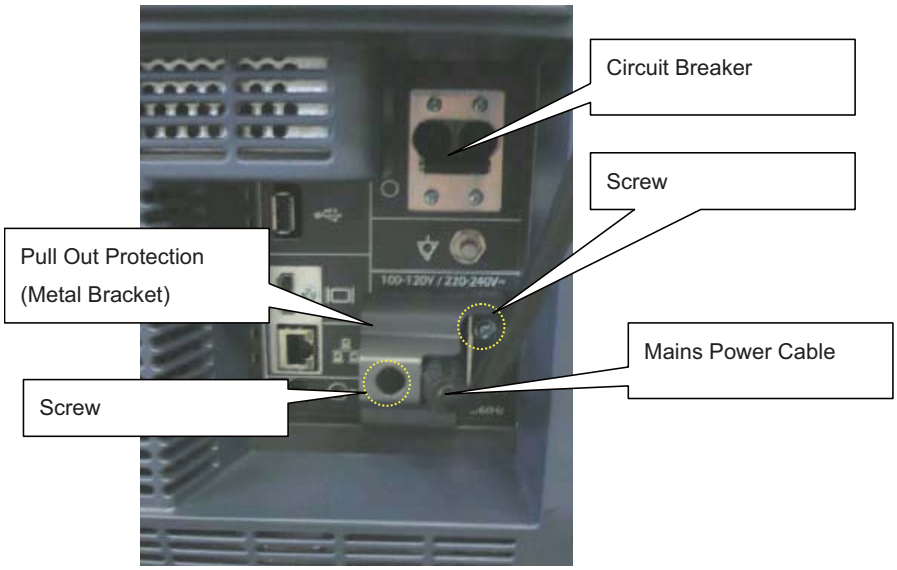


Figure 3-10 Circuit breaker and main power cable at rear of system

8.) Connect the Power Cable's other end (male plug) to a hospital grade mains power outlet with the proper rated voltage, and the unit is ready for Power ON/Boot Up.

NOTE: The power for on-board peripheral auxiliary equipment are commonly switched with the power button. The power switch of any attached printer(s) needs to be in ON position before starting the system. However, be aware some auxiliary equipment may switch itself to standby mode (e.g., Color video printer) and must therefore be switched on separately.

3-7-2 Power ON

NOTE: The mains outlet of the system for peripheral auxiliary equipment are commonly switched with the ON/OFF standby button. So the auxiliary equipment need not to be switched ON/OFF separately.

1.) Switch ON the Mains Power Circuit Breaker at the rear of the system. The power button turns on a light as blue.

2.) Press once the power button on the Operator Control Panel to boot the system. The power button turns on a light as green.

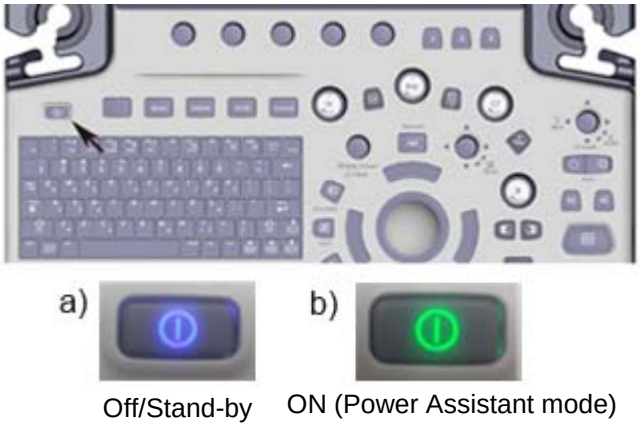


Figure 3-11 Power Button

3.) The System (including the Back-end Processor) starts and the operating system is loaded which then leads the application software to activate the scanner.

During a normal boot, you may observe

- Power is distributed to Peripherals, Operator Panel (control panel), Monitor, Front-End and Back-End Processor.
- The Back-End Processor and rest of the scanner starts with the sequence listed in following steps:

  a.) “Boot Screen” is displayed.

  b.) Back-End Processor is turned ON and starts to load the software.

  c.) The Start Screen is displayed on the monitor.

  d.) Start-up progress bars indicating software loading procedures, are displayed on the monitor.

  e.) The software initiates and sets up the Front-End electronics and the rest of the scanner (incl. the clicking sound of the relays on the PID board).

  f.) The Keyboard backlight is lit.

4.) As soon as the software has been loaded, the system enters B-Mode with the probe connected to port nearest to a user. Total time used for start-up is about 2 minutes. The power button on the Control Panel and indicator color.

3-7-3 Login

At login, you are notified that “You are accessing a diagnostic medical device that is provided by authorized usage only. Data stored on this device may be subject to various regulations including but not limited to regulations which govern disclosure and privacy of this data. By using this device you are acknowledging that you are authorized to do so and are trained in appropriate use and regulatory guidelines.”

NOTICE The System Administrator manages system groups, users, and permissions. After you have been added as a valid user, the System Administrator assigns you a temporary password. When you log into the system for the first time, you will be prompted to change your password.

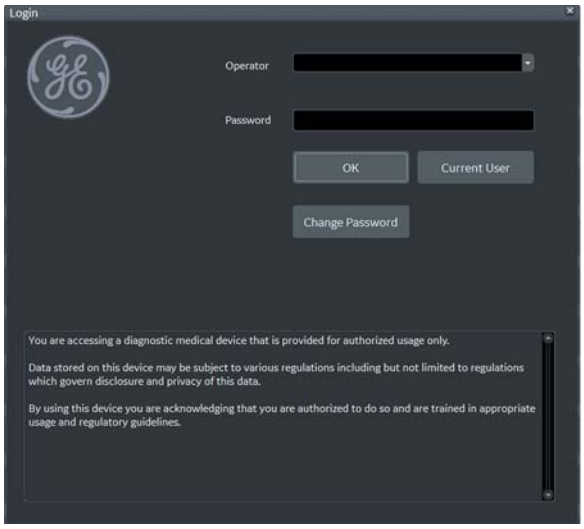


Figure 3-12 Login Window (Example of R4.2.5x)

After you have established your password, follow these steps to login.

1.) Type your user name in the **Operator** field.
2.) Type your password in the **Password** field.
3.) Press **OK** to login, or **Cancel** to cancel login.

3-7-4 Logoff/Shutdown/Exit

1.) When you lightly press the **Power On/Off** switch once. The System-Exit window is displayed.

System Exit Window - R1

System Exit Window - R2 and later

2.) The SYSTEM - EXIT menu, used when power off the unit, gives you these choices:

- **Logoff**

  Use this button to log off the current user. The system remains ON and ready for a new user to log on. If the Logoff button is dimmed, it indicates that no user is logged on to the unit at the moment.

- **Shutdown**

  Use this button to shut down the system. The entire system will shut down. The power button turns on blue indicated Standby- mode (refer to Section Figure 3-11 "Power Button" on page 3-19).

  For the system with R4.2.5x and later, press Power On/Off button three (3) times to shutdown.

NOTE: If the system has Small/Extended battery (Option), the system automatically starts battery-charging when goes to Standby-mode.

- **Cancel**

  Use this button to exit from the System-Exit menu and return to the previous operation.

- **Exit** (Only available when logged in as GE Service with Service Dongle)

  Select this button when you want to exit to the Windows Desktop. Refer to Section Section 7-3 "Exit to Windows Desktop" on page 7-5.

- **Sleep (R1 to R4)**

  Select this button to go to SLEEP mode. Refer to Section 3-7-6 "Sleep Mode (R1 to R4)" on page 3-23.

3-7-5 Complete shutdown

NOTICE After turning off the system, wait at least 10 seconds before turning it on again. The system may not be able to boot if power is recycled too quickly.

NOTE: The mains outlet of the system for peripheral auxiliary equipment are commonly switched with the power button. So the auxiliary equipment need not to be switched ON/OFF separately.

1.) Enter the scan screen and lightly press the **Power On/Off** switch once. The System-Exit window is displayed.

2.) Select **Shutdown**. The system performs an automatic full shutdown sequence.

NOTICE The system will go to Power Assistant Mode (Optional, R2 or later) if above procedures are skipped.

NOTICE Be sure to wait with the next step until the system has finished its shut-down. Failing to do so may destroy data on the Hard Disk Drive, making the system fail later.

3.) Switch OFF the Circuit breaker on the rear panel of the system.

4.) After complete power down, disconnect the main power cable from the system or unplug it from the AC wall outlet socket.

WARNING ***Confirmation of LED status is necessary when repairing the system.***

Confirm the Power Status LEDs are OFF.
- If the LEDs are turned ON, attempt to shut down the system again.
- If unable to turn off the system, press and hold the Power on/off button to force shutdown.

NOTE: For R4 or later system with Extended Battery option, the extended battery is charged when the LOGIQ S8 in Standby-mode. While battery charging, LED is blinking and main fan is operating. But you can turn off the circuit breaker and disconnect the power cable when the battery is charging.

3-7-6 Sleep Mode (R1 to R4)

NOTE: This procedure assumes the system is already up and running.

This feature is not a substitute of a regular shutdown. The system should be shutdown completely at least once a day to prevent performance issues.

CAUTION **You need to wait at least one minute after the monitor blacks out before unplugging the power cable. The system is still in the process of going into Sleep Mode after the monitor blacks out.**

1.) To going into the sleep mode, enter the scan screen and lightly press the **Power On/Off** switch once. The System-Exit window is displayed.
2.) Select **Sleep**. The system performs sequence to go to SLEEP mode.
3.) Unplug the power cable from the wall outlet.
4.) Plug the power cable to the wall outlet.
5.) To exit out of Sleep Mode, press the On/Off switch. Boot time is about 90 seconds.

3-7-7 To change your password

You can change your password when first logging onto the system.

1.) Type your name in the **Operator** field.

2.) Press the **Change Password** button. The **Change Password** pop-up displays.

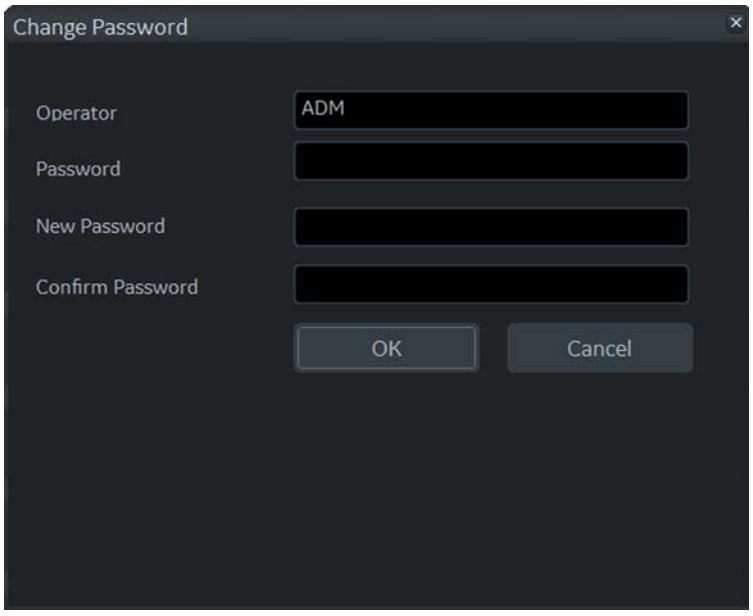


Figure 3-13 Change Password Pop Up

3.) Type the following:

- **Password**: Type your current password.
- **New Password**: Type your new password.
- **Confirm Password**: Retype your new password.

4.) Press **OK** to confirm your changes, or **Cancel** to cancel your changes.

3-7-8 Password policies

To create password policies:

1.) Navigate to **Utility** > **Admin** > **Logon**.

2.) Select **Enable Password Policies**. The system prompts the user for a password at logon.

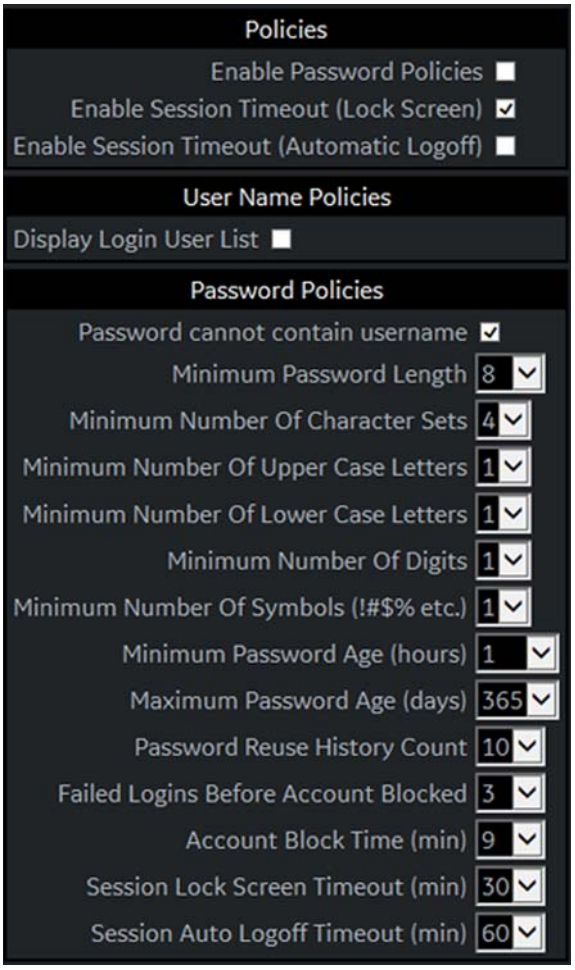


Figure 3-14 Policies Window (Example of R4.2.5x screen)

3.) Under **Password Policies**, use the drop down selection beside each feature to set the rules for passwords.

4.) Click **Save**.

To add users:

1.) Navigate to **Utility > Admin > Users**.

2.) Select **Add** and enter the user details.

NOTE: You will need to edit the ID field from NewUser default. Do not push "Add" again until adding another user.

DO NOT include the following characters in a user ID: slash (/), dash (-), asterisk (*), question mark (?), an underscore (_), ampersand (&), or blank spaces. Also, DO NOT set up Users with the same initials/signifier.

3.) Enter password using the defined policies.

4.) If needed, select **User Must Change Password**. The user will be prompted to change the password on the next logon.

5.) Under **Group Membership**, select the groups for the new user.

NOTE: The user password is system specific. If the user needs to access multiple systems the password will need to be entered manually on each system.

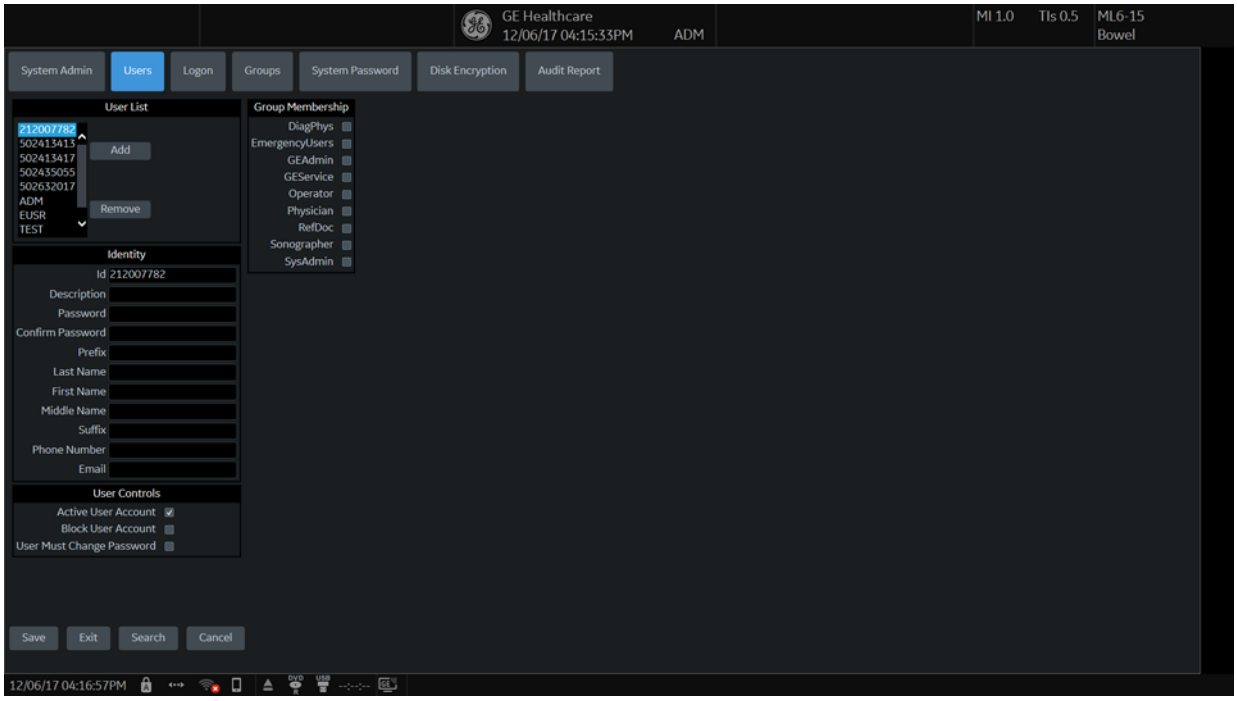


Figure 3-15 Users Window (R4.2.5x screen)

The system administrator can specify whether the users account is Active, Blocked or requires a password change.

The system administrator may also remove a user. Highlight the user Id in the list, select **Remove** to mark the user as inactive and then select **Remove** again to remove user from the list.

To use groups:

You can use predefined groups or create new groups. Assign groups to a user from **Users** and under **Group Memberships**.

1.) Navigate to **Utility** > **Admin** > **Groups**.

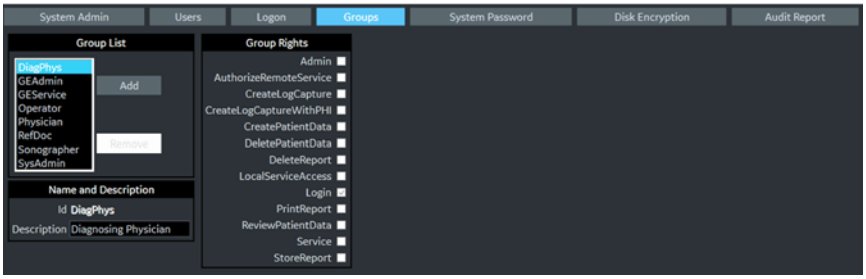


Figure 3-16 Groups Window

2.) To use a pre-defined group:

a.) Under **Group List**, select from the list of groups with pre-determined access is available to select for each new user.

b.) To view access rights for these groups, highlight a group and then, under **Group Rights**, view the access rights.

3.) To create a new group and assign access rights:

a.) Select **Add**.

b.) Under **Name and Description**, type in the name and a description.

c.) Under **Group Rights**, select the boxes according to the users access needs.

d.) Select **Exit** and then select **Admin** before trying to assign new groups to a user.

NOTE: Admin has full system access rights.

To set lock out and log on:

1.) Navigate to **Utility** > **Admin** > **Logon**.

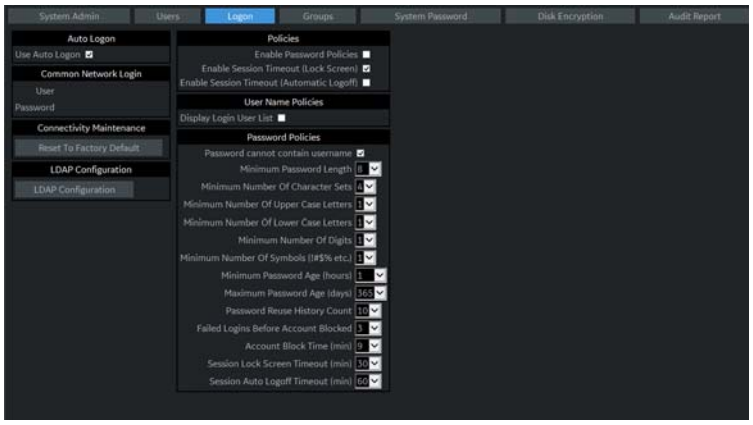


Figure 3-17 Logon Window

2.) Under **Policies**, select **Enable Session Timeout**.

3.) Under **Password Policies**, in **Session Lock Screen Timeout**, select the system idle time for timeout (lock screen) in minutes. The screen will appear completely black when locked (timeout).

4.) Click **Save**.

5.) Press or move any button/trackball on the operator panel to display Login window.

6.) On the **Login** window, enter the user ID, enter the password, and then select **Ok**.

The user will have access according to the rights in their assigned group.

To set auto logon:

Auto LOGON only works when password policies are disabled and if there is no password assigned to the user.

1.) Navigate to **Utility** > **Admin** > **Logon**.

2.) Select **Auto Logon**. The system will start by using the ID of the last operator.

3-7-9 Disk encryption

Patient data disk encryption

Bitlocker Drive Encryption uses Advanced Encryption Standard (AES) with configurable key lengths of 256 bits.

To enable disk encryption:

1.) Navigate to **Utility** > **Admin** > **Disk Encryption**.

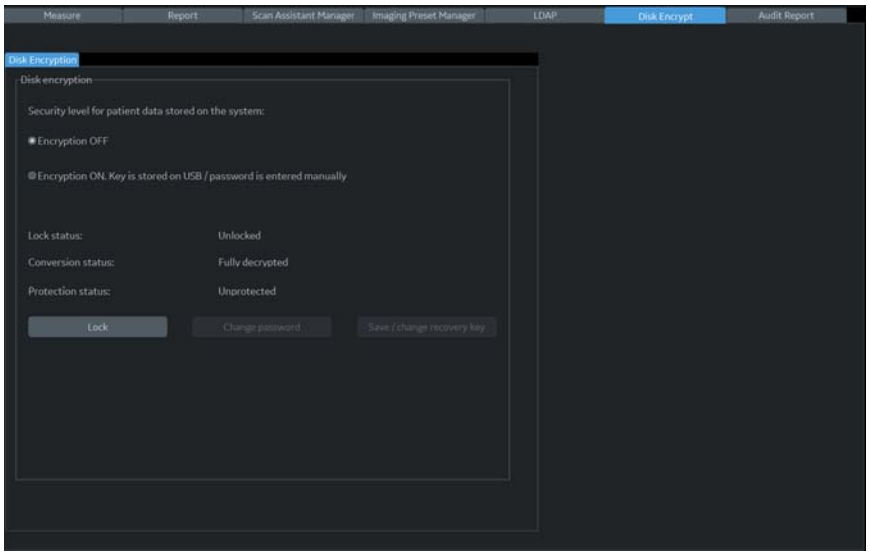


Figure 3-18 Disk Encryption Window (Example of R4.2.5x screen)

2.) Select **Encryption On**.

3.) Select **Yes** to continue.

4.) Create a password to use for each Logon after starting system. This is not the user password, this is system access for all users.

5.) Recovery key is created, this can be saved to a USB flash drive.

6.) Insert a USB flash drive in the USB port on the operator panel or monitor to save the key.

7.) Select **Save** to store the recovery key to the USB flash drive.

8.) Select **Print key** to send the key to a print destination.

9.) Select **Show key** to write down the key.

10.) Select **Change key** if there is a need to create a new key.

NOTE: DO NOT use the USB media for ANY other storage. This should be used for recovery key storage ONLY.

11.) Select **Save** and the recovery key will be displayed one more time.

Figure 3-19 Disk Encryption - Recovery Key Window

12.) If you have not already written the key down you can do so now before moving on.

NOTE: It is important to write down or take a print of the password and recovery key. Store these and the USB key in a secure location.
The displayed recovery key string shown is an example and not a real recovery key. The generated key will always be different.

13.) Select **Ok** to continue. Encryption of data begins. This may take up to 90 minutes the first time. After the initial encryption there is no long process for daily use.

Figure 3-20 Disk Encryption - Encrypting Window

14.) If the recovery key needs to be changed, perform disk encryption again. Insert the USB flash drive and select **Change key**.

Figure 3-21 Disk Encryption - Change Key

After the disk is encrypted, you will be required to unlock the disk at each startup of the system.

The unlock dialog box will appear when the new patient or print button is pushed.

15.) Use one of the methods to access/unlock the system:

- Connect a USB Flash Drive to the system.
- Select **Password** and type the password in the field.
- Select **Recovery key** and then type in the recovery key in the field.

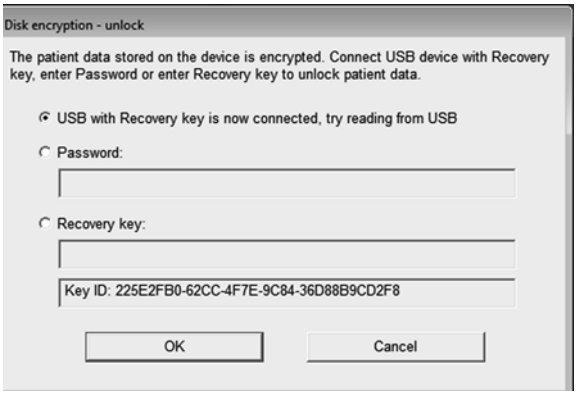


Figure 3-22 Disk Encryption - Unlock

Secure the password and recovery key (including USB memory)

It is recommended the recovery key is stored in a USB flash drive and printed out.

If both password and recovery key are lost, you will not be able to access archived patient data (images and measurements included) nor store new patient data on this system.

The only way to recover the system to allow storing patient data is to reset the entire disk that deletes all the archived patient data in the disk.

It is strongly recommended that all the patient data be stored in PACS or backup to external media.

Section 3-8
System Configuration

3-8-1 Purpose of this section

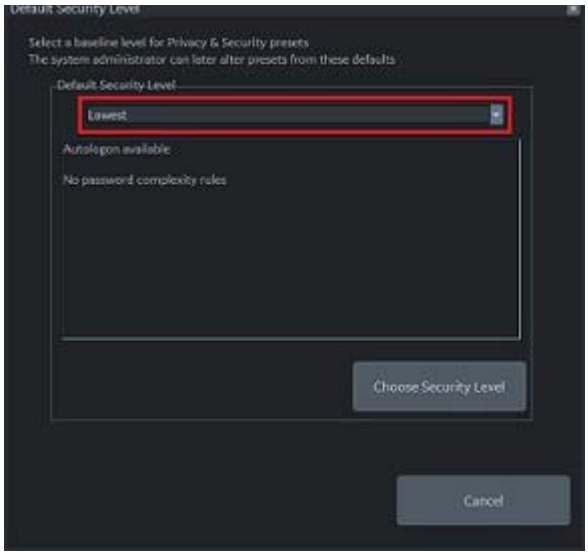
This section describes how to configure the LOGIQ S8.

After completing configuration, as described in this section, next step is to control/adjust connectivity settings, starting with Section 3-11 "Connectivity Setup" on page 3-66.

3-8-2 System Configuration

For complete instructions, refer to the Basic User Manual, Chapter 16 (R1 to R3) or Chapter 10 (R4) in eDoc CD provided with the system or BUM on CDL.

When setting up R4.2.5x systems, select the lowest security level when the system is first booted up. This will allow the system to be tested by Service before handing it over to the system administrator to apply the security level they wish to use.



3-8-2-1 Enter Location, Adjust Date/Time, Select Language

NOTE: In R4 and later, the user can set up user ID restricting the access to Utility, including restricting access to service. Please refer to the user manual for more information.

The System/General screen allows you to specify hospital name and system date and time.

1.) Select **Utility** on the touch panel.

2.) Select **System** and then select **General**.

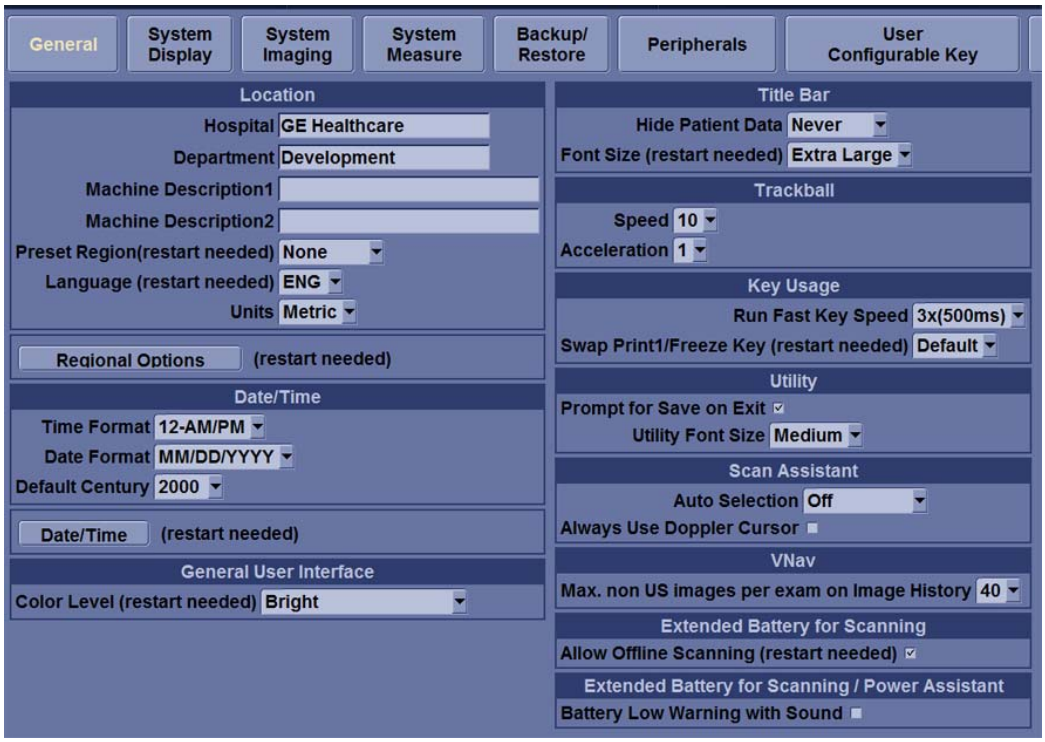


Figure 3-23 System/General Preset Menu

3.) Set Hospital name, Department name, Language, Units, Time/Date format as needed.

4.) To save the changes, select **Save** on the bottom-left. Select **Exit** to return to scanning. In some cases, you may need to reboot the system for the change to take effect.

Table 3-1 Location

Preset Parameter	Description
Hospital	Type the institution's name.
Department	Type the institution's department name.
Preset Region (restart needed)	Select region (None, Americas, Asia, Europe or Japan).
Language (restart needed)	Select the appropriate language from the drop-down list. Note: If you select Japanese (JPN), only the warning and status messages are displayed in Japanese. You can not type in Japanese.
Units	Select metric or US units of measurement.
Regional Options	Select to set up the keyboard.

Table 3-2 Date and Time

Preset Parameter	Description
Time Format	Select the time format: 12 Hr. AM/PM or 24 Hr.
Date Format	Select the date format: dd/mm/yyyy, mm/dd/yyyy, or yyyy/mm/dd.
Default Century	Select the default century for the system to use.
Date/Time	Select to display the Date/Time Properties window, to specify the system date, time, time zone, and to auto adjust for daylight savings time.

3-8-3 Software Option installation

A password (Software Option String) enables a software option or a combination of software options. This password is specific for each LOGIQ S8.

3-8-3-1 Installing a Software Option

1.) Before you install a software option, you must login.

2.) From the Touch Panel, select **Utility** -> **Admin** -> **System Admin**.

3.) Enter the new option key code and select **Add** button in the SW Option Key section.

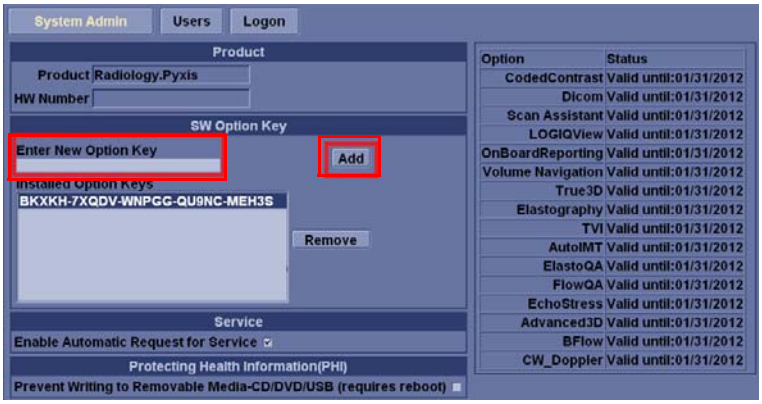


Figure 3-24 System Admin screen

CAUTION **INCORRECT PASSWORD ENTRY WILL RESULT IN LOSS OF SYSTEM OPTIONS. IF PASSWORD IS INCORRECT, PLEASE CONTACT YOUR LOCAL GE SERVICE REPRESENTATIVE OR THE ONLINE CENTER.**

3-8-3 Software Option installation (cont'd)

4.) In R3 and later the Option String can be imported from the media.

Figure 3-25 Option Keys File in R3 and later - Import

Option keys file can be imported from
- Media (CD/DVD, USB)
- Service Folder

There is an **Import** button on the Utilities/ System Admin Preset Menu.

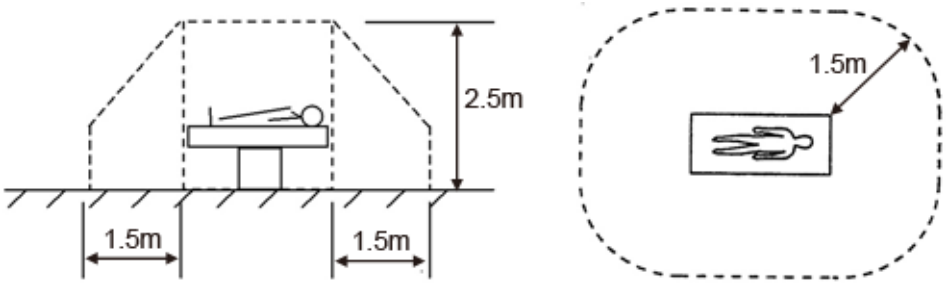
5.) Press **Save** to save the new setting.

6.) Restart to save and activate the settings and adjustments you have done so far.

Section 3-9
Optional Peripherals/Peripheral Connection

WARNING **After each installation, the leakage currents have to be measured according to IEC 60601-1 respectively UL 60601-1.**

CAUTION **Please observe that some printers may not be medical devices! If the Line Printers are not medical devices, they have to be located outside of the patient environment (according to IEC 60601-1 / UL 60601-1).**



NOTE: For more detailed Safety Considerations when connecting auxiliary devices to the LOGIQ S8 system, please review: Section 1-4-6 "Auxiliary Devices Safety" on page 1-20.

NOTE: Normally auxiliary devices and peripherals come pre-installed with the system.

3-9-1 Connecting the Secondary “Patient” LCD Monitor

CAUTION **Secondary LCD “Patient” Monitor MUST NEVER be connected to the LOGIQ S8 mains supply directly!**
Always connect it to the supplied Isolation Transformer!
The Secondary Monitor is the only item to be connected to the Transformer.

CAUTION **When you connect the Off-board/On-board UVC to the Secondary Patient Monitor;**
- If the secondary patient monitor to be located inside of the patient environment, to be connected to the appropriate isolation transformer.
- If the secondary patient monitor to be located outside of the patient environment, no need the isolation transformer.

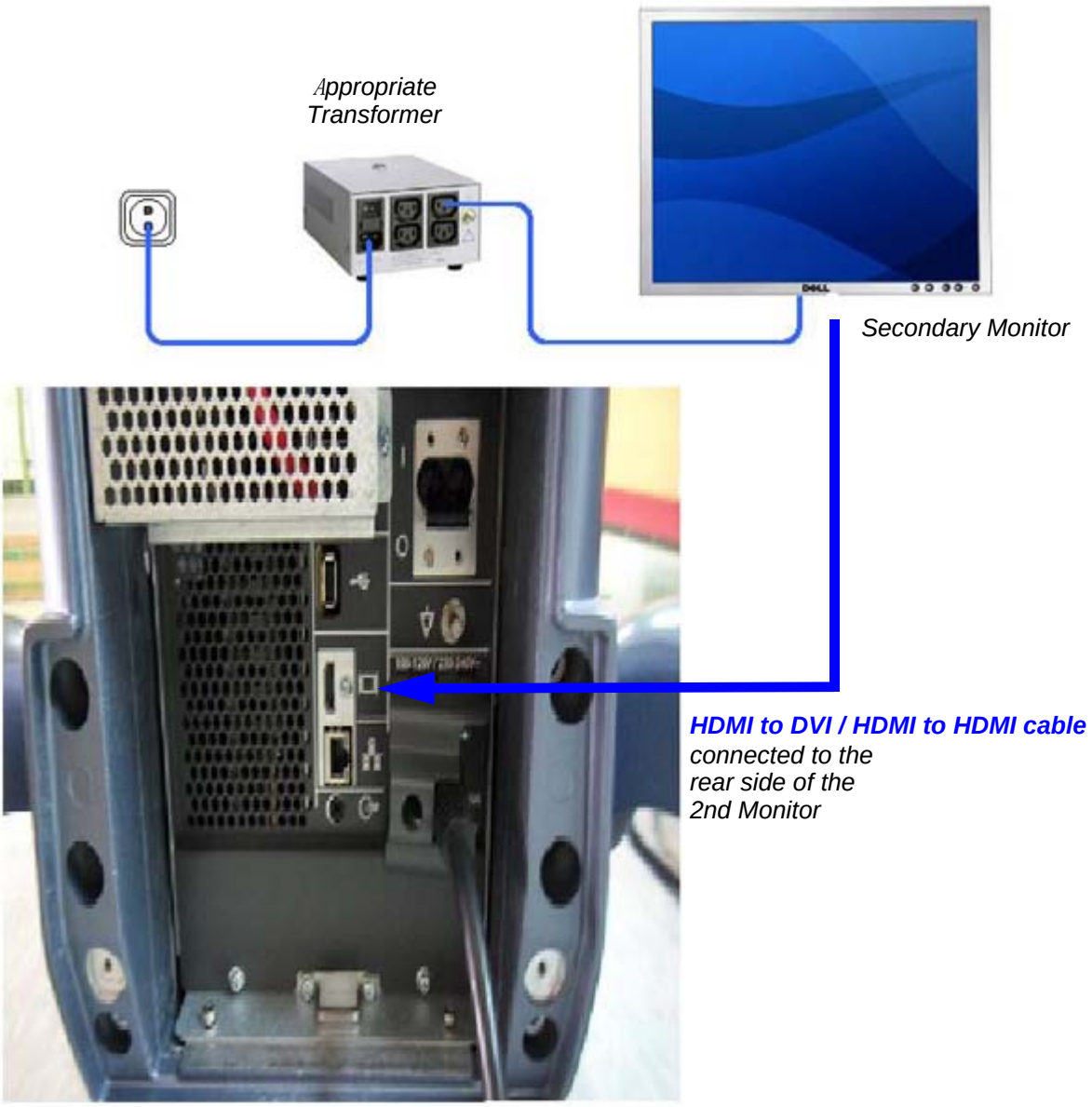
NOTICE Secondary Monitor is **NOT intended for diagnostic use**. It is an additional device used to allow the patient to watch the proceedings.
Take your time to think about the best position of the monitor in your facilities. Patients should be able to view the monitor easily and without having to bend or turn around.

NOTICE Connection to Secondary Monitor is via HDMI cable, but HDMI connector output does NOT carry audio signal.

1.) Power OFF/Shutdown the system as described in Section 3-7 "Power On/Off" on page 3-17.
2.) Connect the Secondary Monitor according to connection scheme.

3-9-1 Connecting the Secondary "Patient" LCD Monitor (cont'd)

3-9-1-1 WIthout UVC



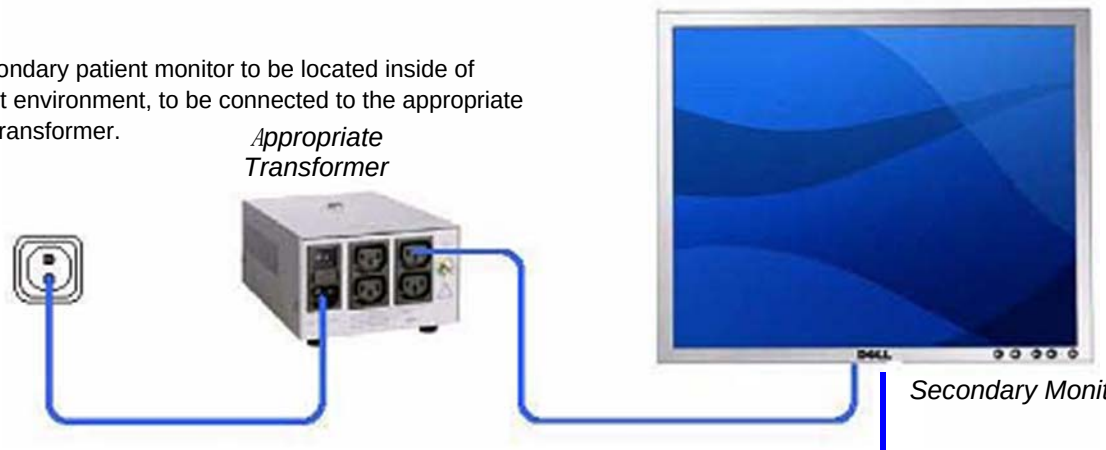
CAUTION

A Secondary "Patient" Monitor **MUST NEVER** be connected to the LOGIQ S8's mains supply directly!
Always connect it to an appropriate **Isolation Transformer**

Figure 3-26 Connection Scheme - Secondary LCD Monitor without UVC

3-9-1-2 With Off-board UVC

If the secondary patient monitor to be located inside of the patient environment, to be connected to the appropriate isolation transformer.



Output connection

Following Output formats are available:

- DVI
- D-SUB (VGA)
- S-VIDEO
- COMPOSITE (BNC)
- COMPOSITE (RCA)

CAUTION

A Secondary “Patient” Monitor **MUST NEVER** be connected to the LOGIQ S8’s mains supply directly!

Figure 3-27 Connection Scheme - Secondary LCD Monitor with Off-board UVC

3-9-1-3 WIth On-board UVC

If the secondary patient monitor to be located inside of the patient environment, to be connected to the appropriate isolation transformer.

Output connection

Following Output formats are available:

- DVI
- D-SUB (VGA)
- S-VIDEO
- COMPOSITE (BNC)
- COMPOSITE (RCA)

CAUTION

A Secondary “Patient” Monitor **MUST NEVER** be connected to the LOGIQ S8’s mains supply directly!

Figure 3-28 Connection Scheme - Secondary LCD Monitor without UVC

3-9-2 Connecting the Off-Board/On-Board UVC

3-9-2-1 Connecting the Off-Board UVC

1.) Power OFF/Shutdown the system as described in Section 3-7 "Power On/Off" on page 3-17.

2.) Connect the UVC according to correct connection scheme.

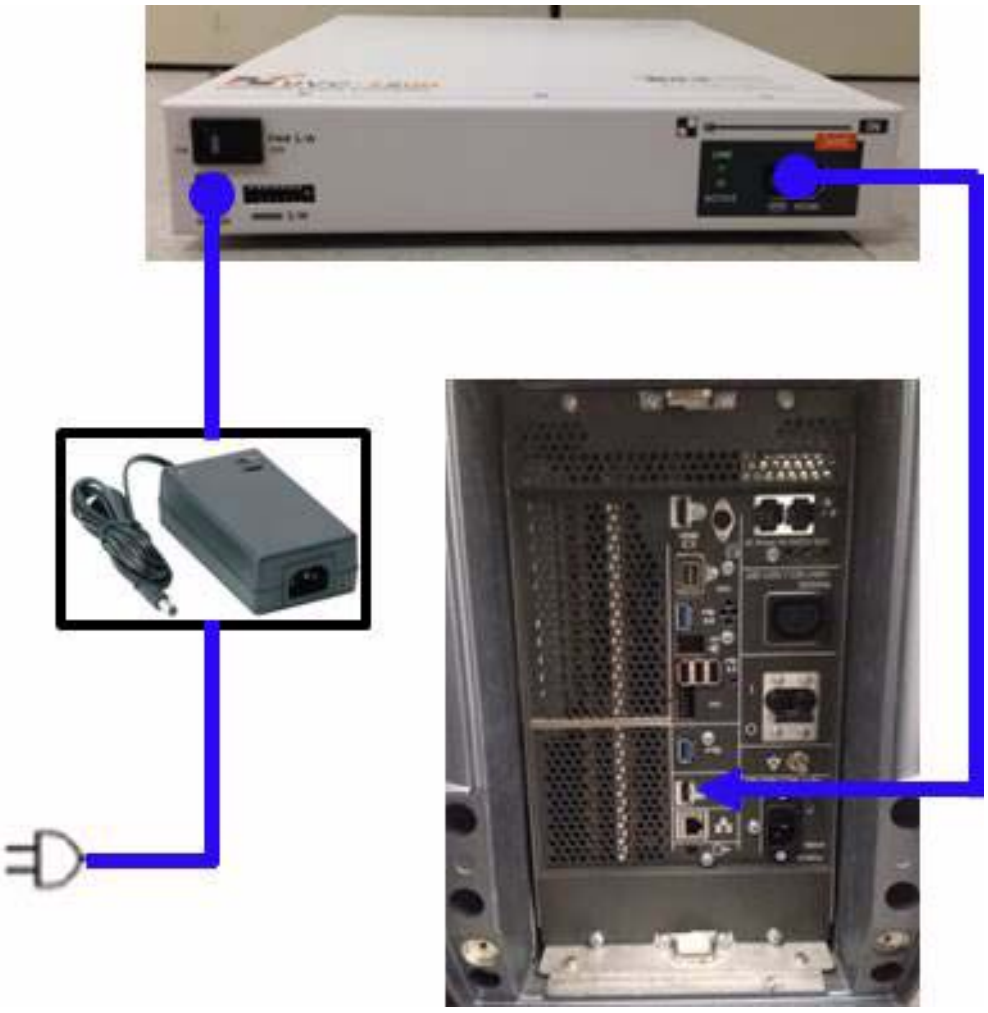


Figure 3-29 R2 Off-Board UVC Connection

3-9-2-1 Connecting the Off-Board UVC (cont'd)

Figure 3-30 Off-Board UVC Connection for R3 and later

3.) When all the cables are connected, press the Power ON switch on the UVC.

4.) Power ON/Boot up the system as described in Section 3-7 "Power On/Off" on page 3-17.

3-9-2-2 Connecting the On-Board UVC

WARNING **AFTER EACH INSTALLATION, THE LEAKAGE CURRENTS HAVE TO BE MEASURED ACCORDING TO IEC 60601-1 RESPECTIVELY UL 60601-1.**

1.) Power OFF/Shutdown the system as described in Section 3-7 "Power On/Off" on page 3-17
2.) Connect the UVC according to correct connection scheme.

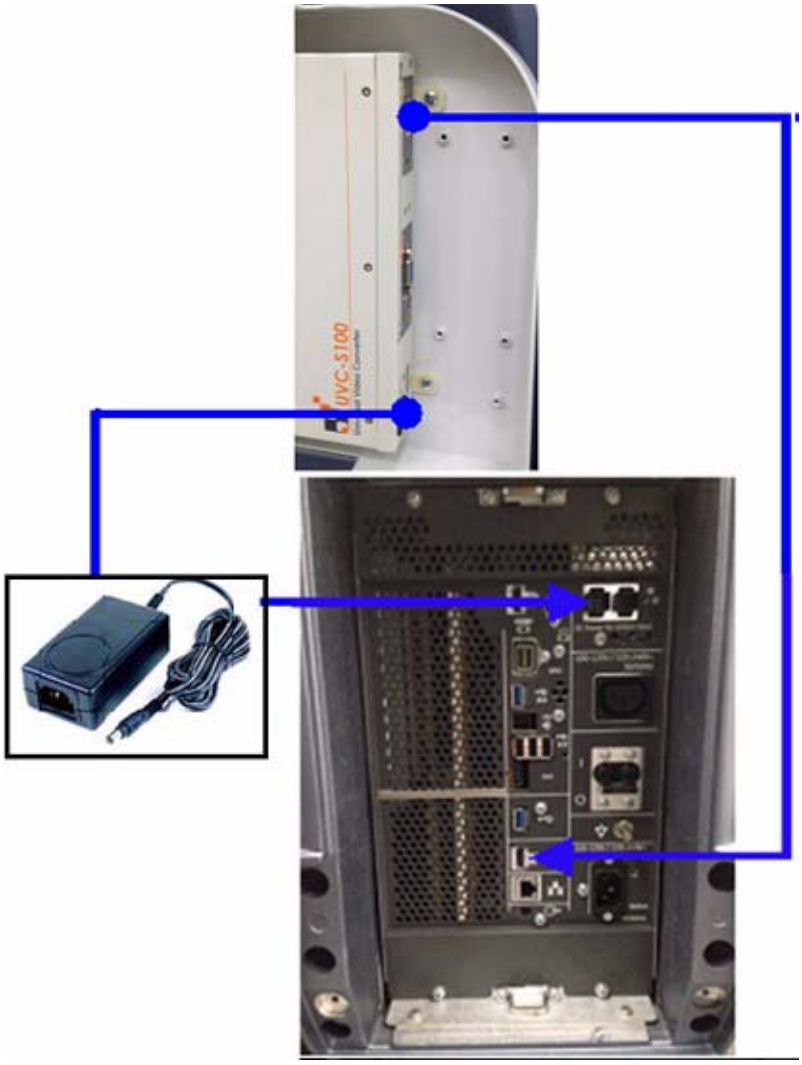


Figure 3-31 R2 On-Board UVC Connection

3-9-2-2 Connecting the On-Board UVC (cont'd)

Figure 3-32 On-Board UVC Connection for R3 and later

3.) When all the cables are connected, press the Power ON switch on the UVC.

4.) Power ON/Boot up the system as described in Section 3-7 "Power On/Off" on page 3-17.

3-9-2-3 UVC functional check Procedure

1.) Connect output (DVI or D-sub or S-video/Composite) on UVC to the external monitor.

2.) Turn the system ON and wait for about 30seconds. (It takes about 30 seconds for UVC booting).

3.) Check that image on external monitor is displayed right. If you connect S-video/Composite port on UVC to the external monitor, cropped image (only Scan area out of the main display) will be displayed on the external monitor.

3-9-3 Connecting the Footswitch

The footswitch should be directly connected to any accessible USB-port on the system (e.g., on rear of the system).

NOTE: Connection of the Footswitch is always the same (no differences between PC-Motherboard version of the system).

After physical connection, configure the Footswitch functionality (Left/Center/Right) via the Utility -> Applications -> Footswitch parameters.

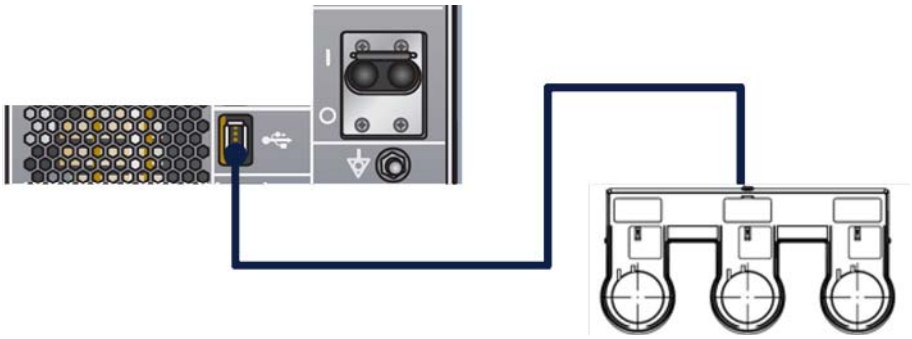


Figure 3-33 Connection Scheme - Footswitch

3-9-4 ECG connector

Connect the ECG cable to the ECG connector on the monitor arm or on the side of the operator panel, depending on the system version.

Figure 3-34 ECG Connector location (R1 to R3 system)

Figure 3-35 ECG Connector location (R4 system)

Figure 3-36

3-9-5 Connecting the USB Flash Drive and USB External Hard disk drive

NOTICE Before connecting an USB device, please read Section 3-9-5-1 "General Remarks and Hints when using external USB-Devices" on page 3-48.

The USB Flash Drive and USB External HDD may be connected to an accessible USB port of the system. Refer to Section 3-6-3 "Connection the I/O Rear Panel" on page 3-14.

The USB Flash Drive and USB External HDD can be connected once the system is powered ON, or after shutdown. The LOGIQ S8, Windows detects the device and automatically installs a driver. During this process several dialogs may pop up, starting with the „Found New Hardware" dialog.

NOTE: The external USB-storage device (such as a USB memory or an external hard disk) may be sensitive to EMC interference. This may affect system performance and/or image quality.

NOTICE Before disconnecting an external USB-storage device (such as a USB memory or an external hard disk), the system has to be informed about the removal of the device! For this purpose press **F3** (Eject) on the keyboard.
For further details refer to: Section 3-9-5 "Connecting the USB Flash Drive and USB External Hard disk drive" on page 3-48.

3-9-5-1 General Remarks and Hints when using external USB-Devices

WARNING **Do not connect or disconnect any external USB-devices to or from the system while scanning a patient! The appearing dialogs could distract you from the scan!**

3-9-5-2 External USB-Devices - Connection

When an external USB-storage device (such as a USB memory or an external hard disk) is connected to the LOGIQ S8, Windows detects the device and automatically installs a driver. During this process, several dialogs may pop up, starting with the "Found New Hardware" dialog.

The device is then accessible using the drive letter the system assigned to it.

NOTICE When connecting external USB devices, be sure to execute Safety Directions found in the Basic User Manual.

3-9-5-3 External USB-Devices - Disconnection

CAUTION **Unplugging or ejecting USB devices without first stopping them can often cause the system to crash and possibly result in loss of valuable data.**

To stop the external device, press **F3** (Eject).

3-9-5-4 General Remarks and Hints when using external USB3.0 Devices (R4 or later)

NOTICE USB 3.0 storage device (Super-speed, such as a USB memory or an external hard disk) highly depends on its signal quality to establish the stable connection with the system.

Some devices may not be recognized or may have unstable connection with the system due to its signal quality when it is connected to the USB 3.0 port on the operator panel.

In that case it is recommended to use the USB 2.0 ports on the side of the monitor instead of the USB 3.0 ports.

For stable connection, it is recommended to use the certified USB3.0 storage device with the USB 3.0 ports.

Section 3-10
Printer Installation

3-10-1 Installing Digital Black & White Printer Sony UP-D897/D898

1.) Power OFF/Shutdown the system as described in: Section 3-7 "Power On/Off" on page 3-17.

2.) Connect the B/W printer as described below.

NOTE: There are three USB ports (stack) on rear panel. The BW printer may be connected to any of the 3x USB stack connector.

3.) When all the cables are connected, press the power button to ON on the printer.

4.) Power ON/Boot up the system as described in Section 3-7 "Power On/Off" on page 3-17. All software drivers are pre-installed for the designated Black & White printer only.

5.) After physical connection to the system, assign the printer to a remote key as described in Section 3-10-3 "Adding the printer to the system" on page 3-64.

6.) Verify the correct settings in the printer “Properties”, see: Section 3-10-1-2 "UP-D897/D898 - Printer Settings" on page 3-52.

WARNING **After each installation, the leakage currents have to be measured according to IEC 60601-1 respectively UL 60601-1.**

3-10-1-1 Connection Scheme: Black & White Printer

Figure 3-37 R1 and R2 Black & White Printer connection

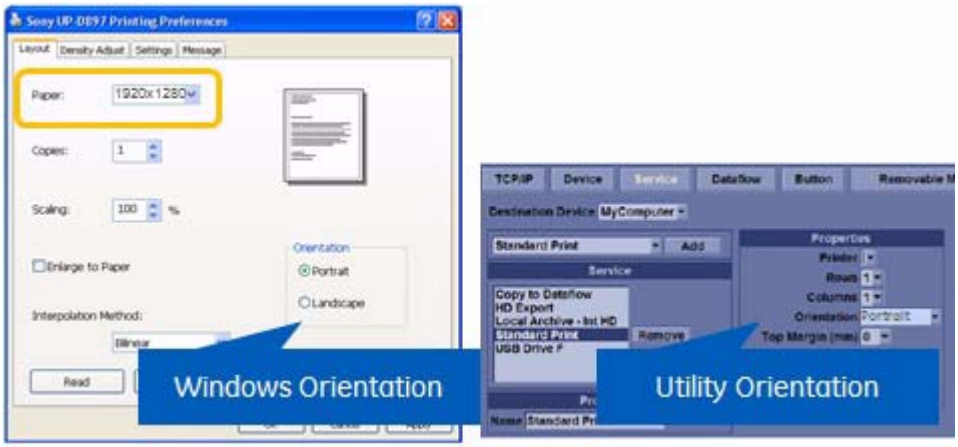
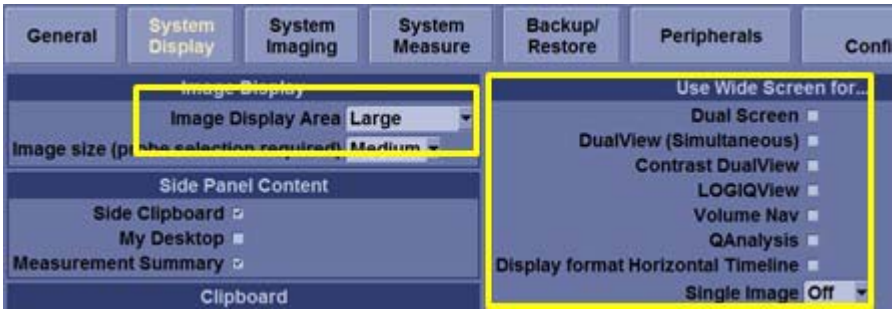
3-10-1-1 Connection Scheme: Black & White Printer (cont'd)

Figure 3-38 Black & White Printer connection for R3 and later

3-10-1-2 UP-D897/D898 - Printer Settings

NOTE: Recommend to use one of three method below for printer setting.

Table 3-3 Settings for UP-D897/D898

Recommended Setting	• Paper size: **1920x1280** • Windows Orientation: **Portrait** • Utility Orientation: **Portrait** 
Avoid using WIDE setting	In Utility -> System -> System Display • Image Display Area: **Large** or **Default** • Turn OFF all parameters in Use Wide Screen for... 
Use Large Print Setting	• Paper size: **1920x1280** • Windows Orientation: **Landscape** • Utility Orientation: **Landscape**

3-10-1-2 UP-D897/D898 - Printer Settings (cont'd)

1.) Select **Portrait** for Orientation in **Utility** -> **Connectivity** -> **Service** and press **Save** in the bottom left.

2.) Select **Utility** ->**System** ->**Peripherals**.

3.) Select the printer to adjust (UP-D897/D898) from the pull-down menu under Standard Printer Properties. Click **Properties**.

4.) Select Properties from Printer pull-down menu.

5.) Click **Printing Preferences** at the bottom of Properties Window.

6.) Select Layout tab and select:

- Paper: **1920x1280**
- Orientation: **Portrait**
- Interpolation Method: **Bilinear**

7.) Select the Density Adjust tab and select:

- Gamma: **TONE2**
- Sharpness = **0**; Dark = **0**; Light = **0**; Sharpness = **2**

8.) For saving the adjusted printer settings click **Apply** and then **OK**.

9.) Close the 'Printers' -window with the close button.

10.) Exit System Setup with **Save&Exit.**

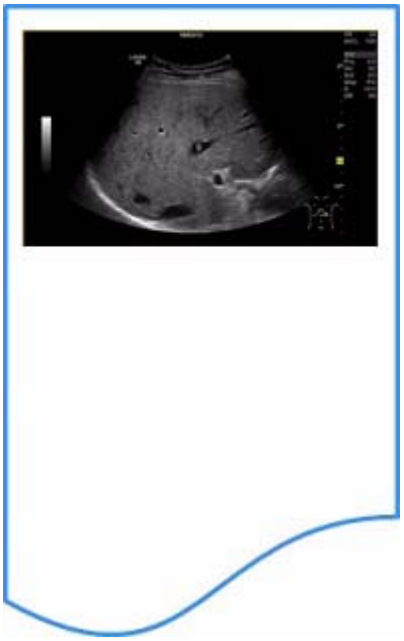
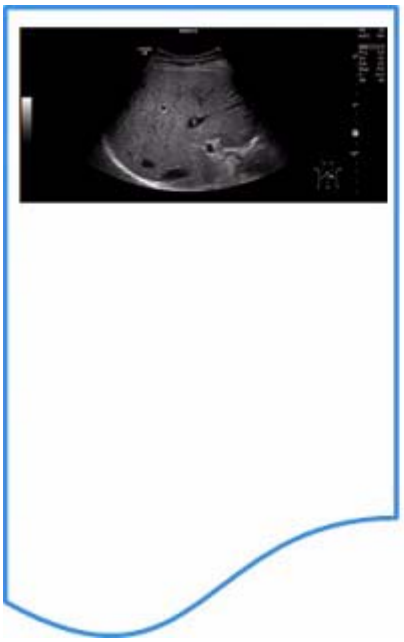
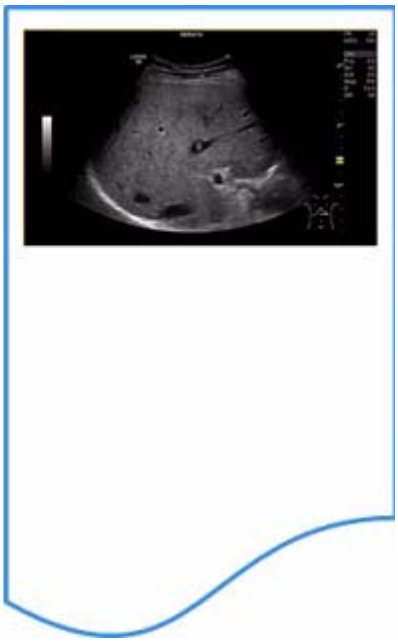
11.) Assign the Printer to the remote keys.
see: Section 3-10-3 "Adding the printer to the system" on page 3-64.

3-10-1-3 BW Printer shape differences

Setting:

- 1920x1280
- Portrait in Printer Properties
- Portrait in Utility -> Connectivity -> Service

Table 3-4 Print example of Portrait, Portrait

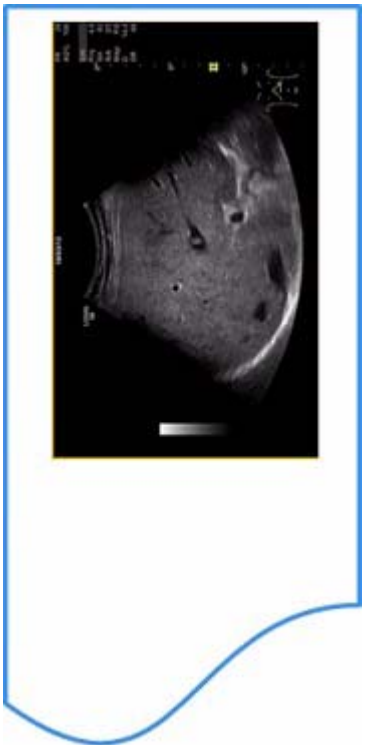
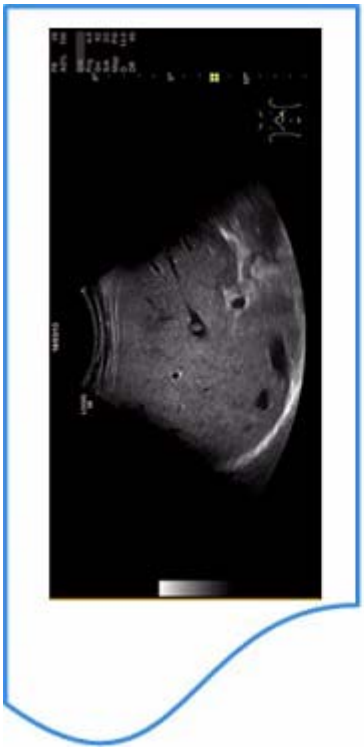
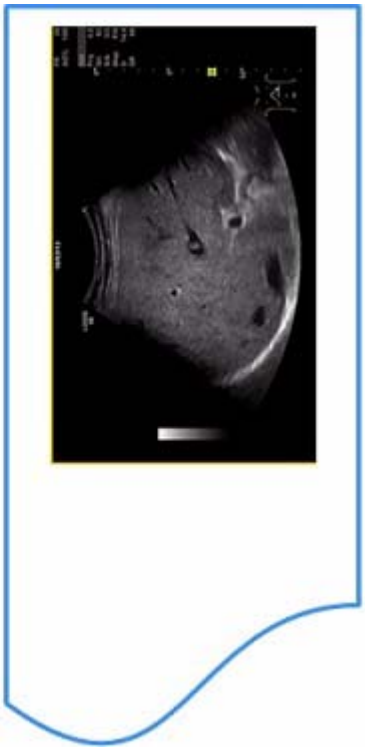
19” Monitor	22”/23” Wide Monitor	
	Wide ON	Wide OFf
		

3-10-1-3 BW Printer shape differences (cont'd)

Setting:

- 1920x1280
- Landscape in Printer Properties
- Landscape in Utility -> Connectivity -> Service

Table 3-5 Print example of Landscape, Landscape

19" Monitor	22"/23" Wide Monitor	
	Wide ON	Wide OFf
		

3-10-1-3 BW Printer shape differences (cont'd)

Setting:

- 960x1280 -> Print output differ by BW Printer Model to orientation.

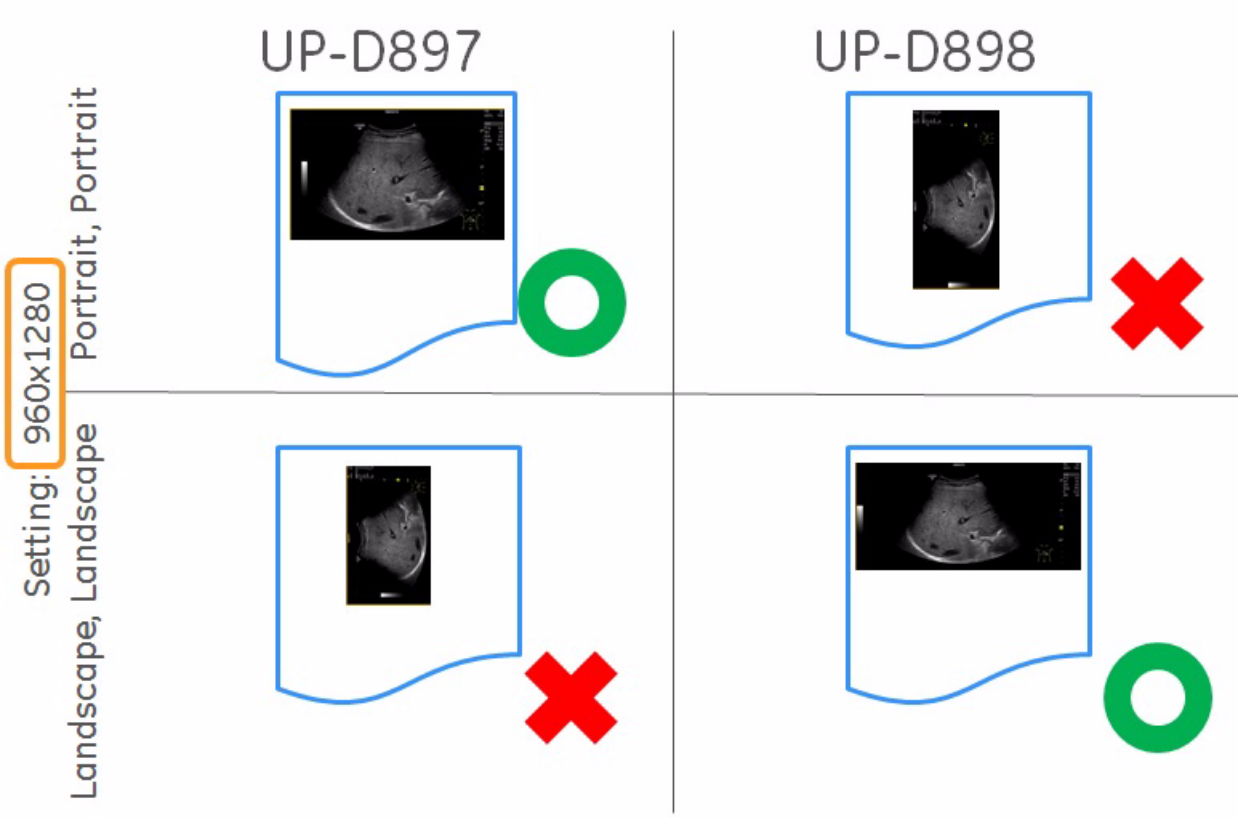


Figure 3-39 960x1280 Print output

3-10-1-4 BW Printer setup summary

Table 3-6 Setup Summary

System	Printer	Size	Win*	Util**	Print Size (approx)	Note
R1	UP-D897	960x1280	P	P	Medium	Previous Service Manual recommendation
		1920x1280	P	P	Medium	New recommendation
		1920x1280	L	L	Large	
	UP-D898	N/A	N/A	N/A	N/A	R1 uses UP-D897 emulation
R2	UP-D897	960x1280	P	P	Medium	Previous Service Manual recommendation
		1920x1280	P	P	Medium	Recommended
		1920x1280	L	L	Large	
	UP-D898	960x1280	P	P	Very small	Unfit for use
		1920x1280	P	P	Medium	Recommended
		1920x1280	L	L	Large	
R3 Upgrade	UP-D897 UP-D898	960x1280	P	P	Small or Medium	Not recommended on UP-D898
		1920x1280	P	P	Medium	Recommended (Monitor size same as R1/R2)
		1920x1280	L	L	Large	
R3	UP-D897 UP-D898	960x1280	P	P	Small or Medium	Not recommended on UP-D898
		1920x1280	P	P	Medium	Slightly smaller image compared to R1/R2
		1920x1280	L	L	Large	Recommended if “Wide” is too small.
R4/R4.2.5x	UP-D897 UP-D898	960x1280	P	P	Small or Medium	Not recommended on UP-D898
		1920x1280	P	P	Medium	Slightly smaller image compared to R1/R2
		1920x1280	L	L	Large	Recommended if “Wide” is too small.

Win* = Windows Printer Setting, L=Landscape/P=Portrait

Util** = LOGIQ Utility Printer Setting, L=Landscape/P=Portrait

3-10-2 Installing Digital Color Printer Sony UP-D25MD

1.) Power OFF/Shutdown the system as described in: Section 3-7 "Power On/Off" on page 3-17.

2.) Connect the Color printer as described below.

NOTE: There are three USB ports (stack) on rear panel. The Color printer may be connected to any of the 3x USB stack connector.

3.) When all the cables are connected, press the power button to ON on the Color printer.

4.) Power ON/Boot up the system as described in Section 3-7 "Power On/Off" on page 3-17. All software drivers are pre-installed for the designated Color printer only.

5.) After physical connection to the system, assign the printer to a remote key as described in Section 3-10-3 "Adding the printer to the system" on page 3-64.

6.) Verify the correct settings in the printer “Properties”, see: Section 3-10-2-2 "UP-D25MD - Printer Settings" on page 3-61.

WARNING **After each installation, the leakage currents have to be measured according to IEC 60601-1 respectively UL 60601-1.**

3-10-2-1 Connection Scheme: Color Printer

Figure 3-40 R1 and R2 Color Printer connection

3-10-2-1 Connection Scheme: Color Printer (cont'd)

Figure 3-41 Color Printer connection for R3 and later

3-10-2-2 UP-D25MD - Printer Settings

1.) Select **Utility** ->**System** ->**Peripherals**. Select the printer to adjust (UP-D25MD) from the pull-down menu under Standard Printer Properties. Click **Properties**.

2.) Select Properties from Printer pull-down menu.

3.) Click **Printing Preferences** at the bottom of Properties Window.

NOTICE Settings for Paper Size MUST match with the used Paper (large/small) and also the right color ink cartridge has to be used. Otherwise you will get an error message at printing.

4.) Select the Paper tab and select:

- Recommended Paper: **UPC-24LA** (large) / UPC-24SA (small)

NOTE: Paper UPC-21L and UPC-21S are also acceptable paper to use.

- Orientation: **Landscape** (recommended when using large paper size)
- **High Speed** (check mark on)

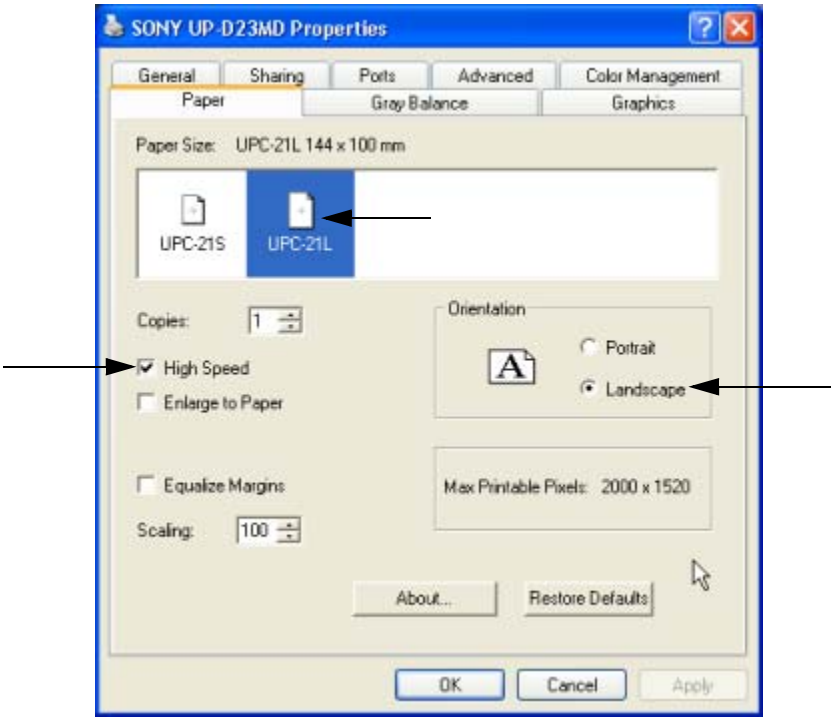


Figure 3-42 Paper page

3-10-2-2 UP-D25MD - Printer Settings (cont'd)

5.) Select the Graphics tab. From the "Color Adjust" pop-up menu select:

a.) Color Balance: Cyan = **0**; Magenta = **0**; Yellow = **0**

b.) Gamma Select: **Gamma 1**

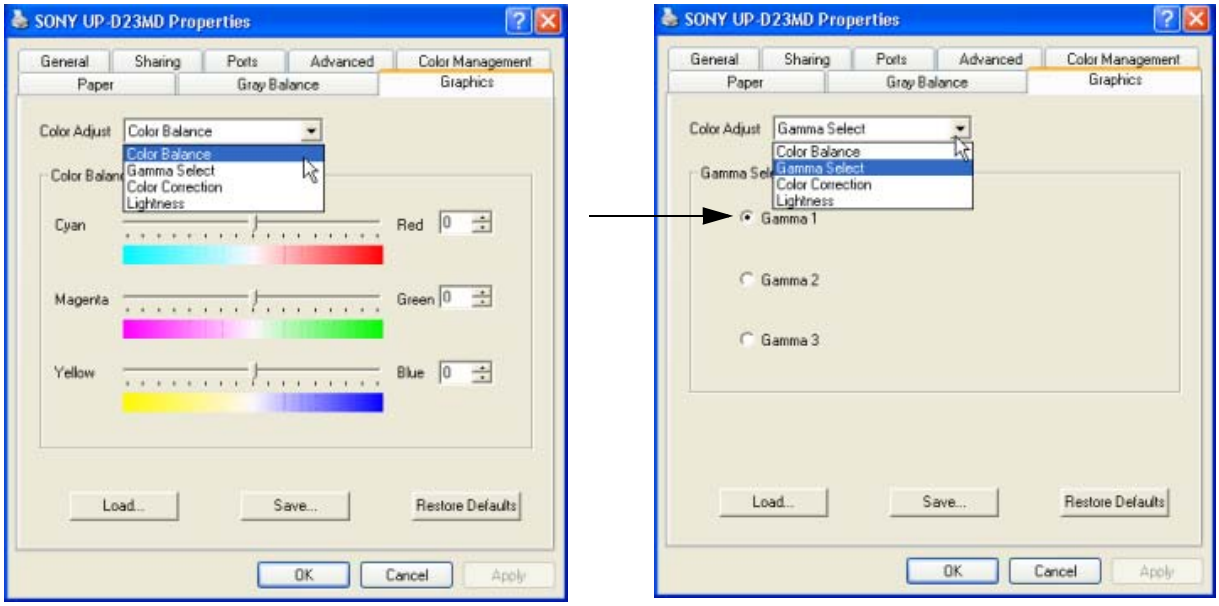


Figure 3-43 Graphics page (Color Balance + Gamma Select)

c.) Color Correction: set **Printer Hardware Color Correction**

d.) Lightness: Sharpness = **7**; Dark = **0**; Gamma = **14**; Light = **0**

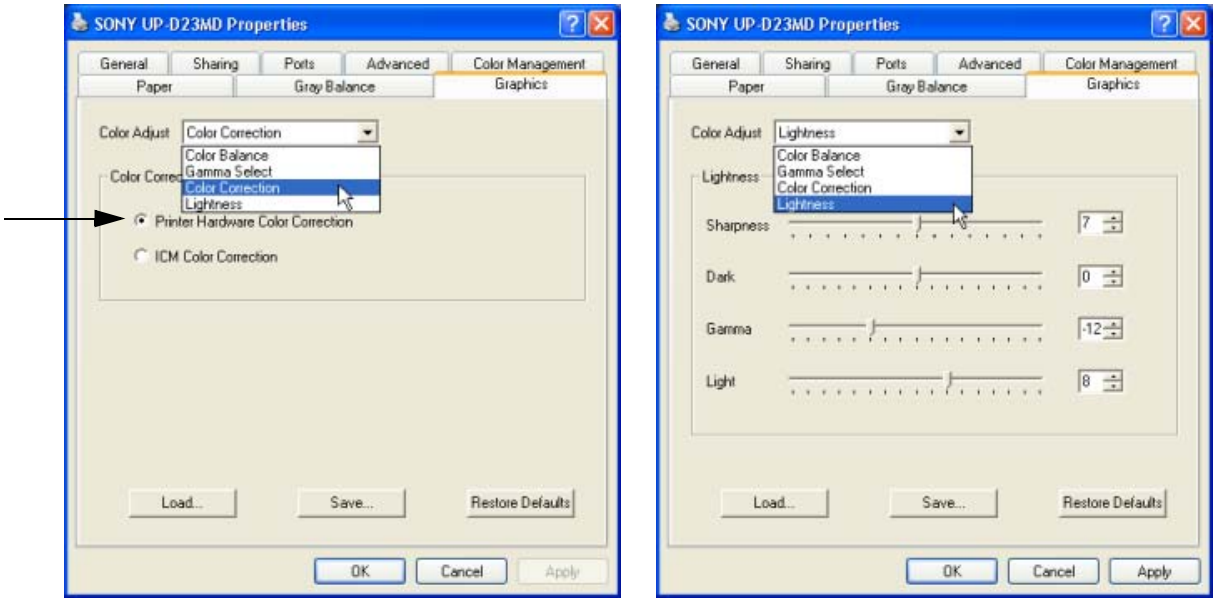


Figure 3-44 Graphics page (Color Correction + Lightness)

3-10-2-2 UP-D25MD - Printer Settings (cont'd)

6.) For saving the adjusted printer settings click **Apply** and then **OK**.

7.) Finally close the 'Printers'-window with the close button and exit System Setup with **Save and Exit**.

8.) Assign the Printer to the remote keys. See: section 3-10-4 on page 3-65.

3-10-3 Adding the printer to the system

1.) Select **Utility** -> **Connectivity** -> **Service**.

2.) Select **Standard Print** and press **Add**.

3.) Highlight Standard Print in the Service list.

4.) Select the printer from the Printer pull-down Properties menu. For the UP-D897/D898 printer, select “Portrait” as orientation.

5.) Type the printer name in the Name field. This name is used on the Button screen. After you select the printer from the Printer pull-down Properties menu again, it turns white.

6.) Press **Save**.

7.) Select **Button**.

8.) Select the appropriate print key (Print1, Print2...) from the Physical Print Buttons section.

9.) Select the printer from the MyComputer column and press >> to move it to the Printflow View column.

10.) Press **Save**.

3-10-4 Setting the printer to print reports

To set up the Off-Line Printer to print reports,

1.) Select **Utility** -> **System** -> **Peripherals**.

2.) Select the printer from Default Printer pull-down menu.

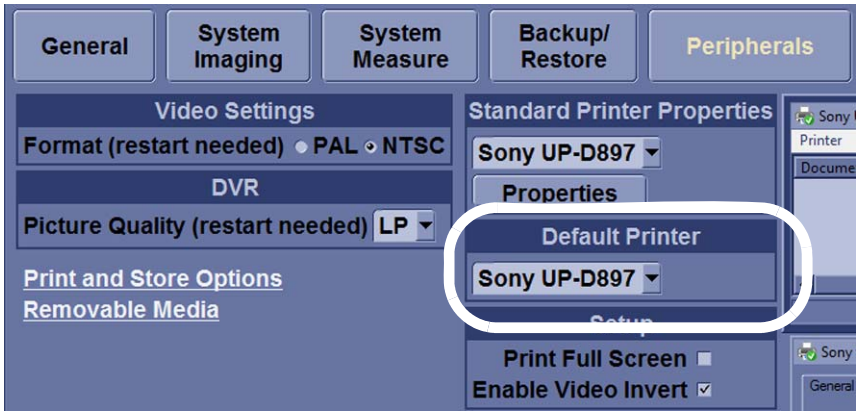


Figure 3-45 Report Printer Setup

3.) Press **Save**.

4.) Press **Print** on the Report screen to print the report.

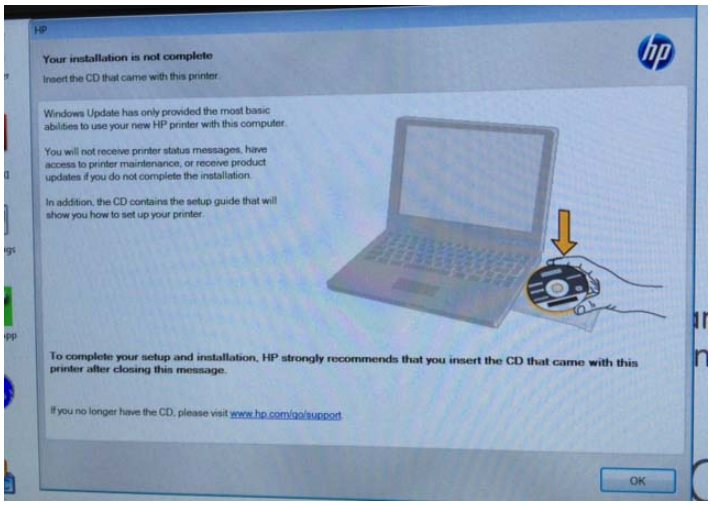
3-10-5 PC printer setup

1.) Turn off the LOGIQ S8.

2.) Connect the PC printer to the LOGIQ S8 (rear USB port).

3.) Turn on the PC printer.

4.) Turn on the LOGIQ S8. The following message appears.



5.) Click OK and shutdown the LOGIQ S8.

6.) Reboot the LOGIQ S8.

Section 3-11
Connectivity Setup

The LOGIQ S8 ultrasound system can be connected to various connectivity devices.
The following sections describe how to connect the system to a remote archive/work station or a DICOM service, using a TCP/IP connection.

3-11-1 Connectivity Introduction

This section describes communication and connection options between the LOGIQ S8 ultrasound unit and other devices in the hospital information system.

The following scenarios are covered:

- stand-alone LOGIQ S8 scanner; see: section 3-11-3 on page 3-68.
- LOGIQ S8 and one or several PC workstations within a “Sneaker Net” environment. (“Sneaker Net” means that you use a DVD/CD to move data because no network is available); see: Section 3-11-4 "LOGIQ S8 + PC within a “Sneaker Net”" on page 3-68.
- LOGIQ S8 and DICOM server in a network; see: Section 3-11-5 "Connection between LOGIQ S8 and DICOM Server" on page 3-68.

3-11-2 The Dataflow Concept

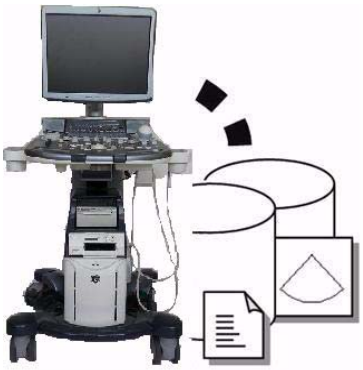
Communication between the LOGIQ S8 ultrasound unit and other information providers on the network takes the form of data flows. Each dataflow defines the transfer of patient information from either an input source to the unit, or from the unit to an output source (see examples in Figure 3-46 on page 3-67).

Patient information can include demographic data and images, as well as reports and Measurement and Analysis (M&A) data.

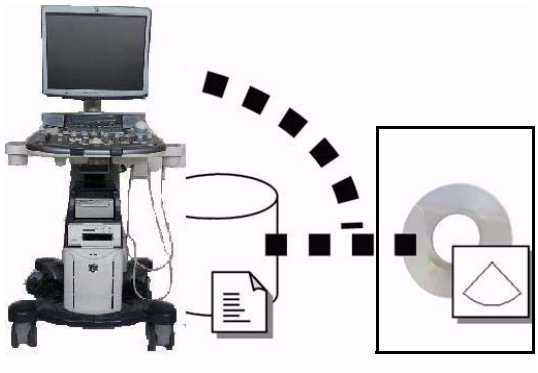
A dataflow is a set of pre-configured services. Selecting a dataflow will automatically customize the ultrasound unit to work according to the services associated with this dataflow.

By utilizing data flows, the user can configure the LOGIQ S8 ultrasound unit to optimally meet the needs of the facility, while keeping the user interface unchanged. Once the dataflow is selected, the actual location of the database is entirely transparent.

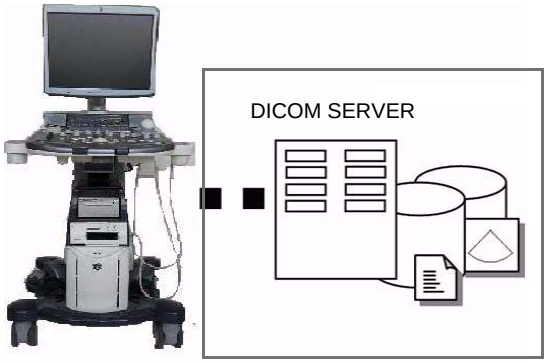
3-11-2-1 Dataflow Examples



The local database is used for patient archiving.
Images are stored to internal hard drive.



The local database is used for patient archiving.
Afterwards images are stored to a DVD/CD or external USB device, etc.



Search in the DICOM Modality Worklist, the patient found is copied into local database.

The patient information and the examination results are stored to the local database.

Images are stored to a DICOM server and to an image network volume on the local hard drive.

Figure 3-46 Examples of Dataflows

3-11-3 Stand-alone LOGIQ S8

If digital images or 3D/4D data sets (if available) are stored, they should be saved in the Archive (Image Management System software).

For Image Management functionality refer to the Basic User Manual supplied with the LOGIQ S8.

NOTICE To avoid loss of essential data, it is highly recommended to **export/backup patient data** as well as measurements **at least once a month**.

Physical Connection:

No network connection needed.

3-11-4 LOGIQ S8 + PC within a “Sneaker Net”

A PC is used for review and work on studies acquired on one or more LOGIQ S8 scanners without being connected in a network.

The images are first stored on the LOGIQ S8 scanner’s hard drive (Archive) and then exported from the scanner’s hard drive to a sneaker device (e.g., DVD/CD), and finally imported from the sneaker device to the PC’s internal hard drive.

For Image Management functionality refer to the Basic User Manual supplied with the LOGIQ S8.

NOTICE To avoid loss of essential data, it is highly recommended to **export/backup patient data** as well as measurements **at least once a month**.

Physical Connection:

No network connection needed.

3-11-5 Connection between LOGIQ S8 and DICOM Server

In this configuration, the LOGIQ S8 is configured to work with a DICOM server in a network environment. Usually, this will be the hospital network. Images are first saved on the local image buffer on the scanner. At the end of the examination, the images are sent to the DICOM server via a DICOM spooler. This scenario requires that the scanner is configured to be connected to the DICOM server.

Physical Connection:

You will need one network cable.

1.) Connect one end of the cable to the Ethernet connector on the LOGIQ S8.

2.) Connect the other end of the cable to the wall outlet.

NOTE: If a Peer-to-Peer Network is connected to the hospital’s network, you may connect the LOGIQ S8 to the Peer-to-Peer Network.

For more details refer to Section 3-12 "Configuring Connectivity" on page 3-72.

3-11-6 Wired Ethernet from LOGIQ S8 to a Workstation

3-11-6-1 Direct Connection from the LS8 to a WS via a Crossover Cable

You only need a Crossover Cable for network use to connect the two units this way.

1.) Connect one end of the crossed network cable to the network connector on the LOGIQ S8.

2.) Connect the other end to the network connector to the Workstation, see the Workstation Service Manual.

3-11-6-2 Connection via a Peer-to-Peer Network

You will need a network switch and one network cable for each unit connected to the switch.

3-11-6-3 Connection via Hospital Network

You will need one network cable to connect the LOGIQ S8 to a wall outlet on the hospital's network.

3-11-7 Connection using Wireless Option (R2.x.x or later)

Refer to:

- 8-35-5 "Wireless LAN Set-up" on page 8-297.
- Chapter 5 for theory.
- Basic User Manual: Chapter 10 Configuring Connectivity.

3-11-8 Network icon

3-11-8-1 R3 and R4

Table 3-7 Network icon description

Icon	Description
	Wired network connected
	Wired network disconnected
	Wireless network connected
	Wireless network disconnected
	Wireless network limited connected • No IP address obtained • Empty IP means “Acquiring Network Address” • private IP means “Limited or no Connectivity”
	Spooler is active with wired network
	Spooler is failed with wired network
	Spooler is active with wireless network
	Spooler is failed with wireless network

3-11-8-2 R4.2.5x and later

Table 3-8 Network icon description

Ethernet Active 	Ethernet Error 	Ethernet Active Spooler Active 	Ethernet Active Spooler Error 
Spooler Active 	Spooler Active Error 	Spooler Inactive 	Spooler Inactive Error 
Wifi 1 Bar 	Wifi 2 Bars 	Wifi 3 Bars 	Wifi 4 Bars 
Wifi Alert 	Wifi Spooler Active 	Wifi Spooler Error 	Wifi Error 

Section 3-12
Configuring Connectivity

3-12-1 Overview

You use Connectivity functionality to set up the connection and communication protocols for the ultrasound system. This page gives an overview of each of the Connectivity functions. Each function is described in detail in the following pages.

3-12-2 Contents in this section

3-12-3 Structured Reporting

DICOM Structured Reporting provides the results of a procedure as structured data elements (well-defined fields) as opposed to unstructured data (large amounts of text undifferentiated by individual fields). This greatly improves query capability. DICOM Structured Reporting creates coded clinical data that can be used for clinical research, outcomes analysis, and disease management.

DICOM Structured Reporting is a standardized format for medical results. LOGIQ S8 supports the following templates:

- OB-GYN REPORT TEMPLATES
- VASCULAR ULTRASOUND REPORT TEMPLATES
- The system supports selectable vessels with their locations for B-Mode measurements.
- For Vascular studies (Bypass Graft, UEV Map, LEV Map, LEA/UEA, and Carotid), additional measurement locations were added. For instance, for a Bypass Graft, there are now measurements at Inflow, Anast, Thigh, Knee, Calf, Ankle, Graft, RunOff, Pre-Sent, Stent, Post-Stent, and Outflow locations.
- ECHOCARDIOGRAPHY PROCEDURE REPORT TEMPLATES

These templates do not support all M&A results for the LOGIQ S8.

3-12-3-1 Supported parameters

The DICOM supported parameters are listed in the DICOM Conformance Statement at the following web site under DICOM - Ultrasound:

http://www.gehealthcare.com/usen/interoperability/dicom/

3-12-4 Connectivity Functions

To set up your institution's connectivity, you must login with administrator privileges.

1.) **TCPIP**: allows you to configure the Internet Protocol.

2.) **Device**. allows you to set up devices.

3.) **Service**: allows you to configure a service (for example, DICOM services such as printers, worklist, and other services such as video print and standard print) from the list of supported services. This means that the user can configure a device with the DICOM service(s) that particular device supports.

4.) **Dataflow**: allows you to adjust the settings of the selected dataflow and associated services. Selecting a dataflow customizes the ultrasound system to work according to the services associated with the selected dataflow.

5.) **Button**: allows you to assign a pre-configured output service (or a set of output services) to the Print keys on the control panel.

6.) **Removable Media**: enables formatting (DICOM, database, or blank formatting) and DICOM verification of removable media.

7.) **Miscellaneous**: allows you to set up the patient exam menu options, print and store options, and the order of the columns in the examination list on the Patient menu.

Configure these screens from left to right, starting with the Tcpip tab first.

NOTE:The ultrasound system is pre-configured for many services, with default settings selected. You can change these services and settings as needed.

CAUTION **You must restart the system (shutdown) after making any changes to connectivity settings in the Utility menus. This includes any changes on the TCPIP or dataflow setup screens.**

3-12-5 TCPIP

This configuration category enables users with administrative rights to set the TCPIP for the system and connected remote archive.

1.) Type the name of the Ultrasound system in the Computer Name field.

2.) In the IP settings section, identify the ultrasound system to the rest of the network by one of the following:

- DO NOT enable DHCP.
- Type the IP-Address (acquire unique static IP address from hospital network administrator), Subnet Mask, and Default Gateway (if applicable).

NOTE: Do not set up the system with DHCP. The IP address MUST BE static for the diagnostic and DICOM to function correctly.

3.) Select **Save settings**.

4.) Re-boot the ultrasound system.

NOTE: TCPIP settings do not get restored when restoring backups. This is per system design. The LOGIQ S8 IP address MUST BE unique.

Figure 3-47 Connectivity TCPIP Preset Menu

Table 3-9 Computer Name

Preset Parameter	Description
Computer Name	Type the unique name for the Ultrasound system (no spaces in name).

3-12-5 TCPIP (cont'd)

Table 3-10 IP settings

Preset Parameter	Description
Enable DHCP	DO NOT select this box to enable dynamic IP Address selection. NOTE: The system shall disable IP-Address, Subnet Mask, and Default Gateway when the user chooses to use DHCP.
IP-Address	Type the IP Address of the Ultrasound system. NOTE: IP stands for Internet Protocol. Every device on the network has a unique IP address.
Subnet Mask	Type the subnet mask address. NOTE: The Subnet Mask is an IP address filter that eliminates communication/messages from network devices of no interest to your system.
Default Gateway	Type the default gateway address.
Network Speed	Select the network speed (Auto Detect, 10Mbps/Half/Full Duplex, or 100 Mbps/Half/Full Duplex/1000Mbps/Auto-negotiate)

NOTE: Reboot the system to activate any changes saved from this page.

3-12-6 Device

To add a new device,

1.) Press ***Add***.

2.) Type the device name in the Name field.

3.) Type the device's IP address in the IP Address field.

Figure 3-48 Connectivity Device Preset Menu

Table 3-11 Device

Preset Parameter	Description
Add/Remove	Press Add to add a new device; press Remove to delete a device.
Ping	Press Ping to confirm that a device is connected.
Properties: Name	Type the name of the device.
Properties: IP Address	Type the device's IP address.
Properties: AE Title	AE Title of the LOGIQ S8. NOTE: Only available for MyComputer.
Properties: Port Number	IP Port Number Used for DICOM, set by default to 104. NOTE: Only available for MyComputer.
Properties: MAC Address	Unique network card address. NOTE: Only available for MyComputer.

To ping a device,

1.) Select the device.

2.) Press ***Ping***. If the smiley face smiles, then the connection has been confirmed. If the smiley face frowns, then the connection has not been made. Check the device name and IP address.

3-12-7 Service

For each Device that you added to the system, you need to set up the service(s) that device supports (you must be an administrator to update these screens).

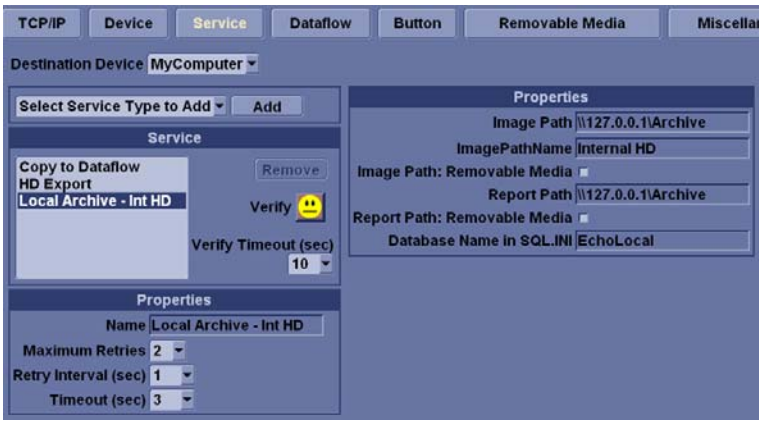


Figure 3-49 Connectivity Services Preset Menu, My Computer - example

Figure 3-50 Connectivity Services Preset Menu, New Device - example

The Services screen has the following sections of information:

1.) Destination Device - lists information about destination devices. You can select from a list of currently existing devices.

2.) Service Type to Add - lists information about services for the destination device. You can add services, select from a list of currently existing services, and remove services.

3.) Service Parameters - lists parameters for the service currently selected in the Services section. The name and parameters in this section change, depending on what service is currently selected. In the above figure, this section shows DICOM Print parameters.

3-12-7-1 Adding a service to a destination device

1.) Select the service from the pull-down menu. Press ***Add***.

2.) Specify the properties for this service. Press ***Save***.

3.) Verify the service.

3-12-7-2 Removing a service

1.) Select the service. Press ***Remove***.

2.) Press ***Save***.

3-12-7-3 Changing parameters for a service

There are certain parameters that may need to be set up for each service:

Table 3-12 Service Parameters: Common Service Parameters

Preset Parameter	Description
Name	Free text: give a descriptive name to the device.
AE Title	The Application Entity Title for the service.
Port Number	The port number of the service.
Maximum Retries	Max # - the maximum number of times to try establishing a connection to the service.
Retry Interval (sec.)	Specify how often (in seconds) the system should try to establish a connection to the service.
Timeout	The amount of time after which the system will stop trying to establish a connection to the service.

Many service parameters are specific to each type of service. The parameters are described on the following pages:

- DICOM Image Storage
- DICOM Performed Procedure
- DICOM Print
- DICOM Query/Retrieve
- DICOM Storage Commitment
- DICOM Worklist
- Standard Print
- Video Capture
- Save As
- Network storage
- USB Quick Save (R2 and later)
- Email to MMS (R4 and later)

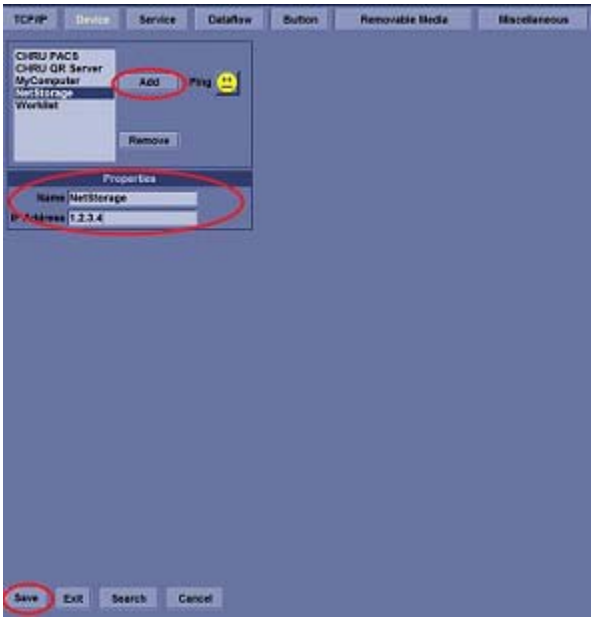
3-12-8 Instructions for setting up Network Storage on LOGIQ S8 R4

1.) IT department will need to create a share folder on the destination PC and provide the name of the Network Share Folder, Static IP Address, Password, User Name and Name of the Shared Directory.

Enter a Name for the Network Share and the IP address provided by IT.

Select Utility >Connectivity on the touch screen then select the Device Tab.

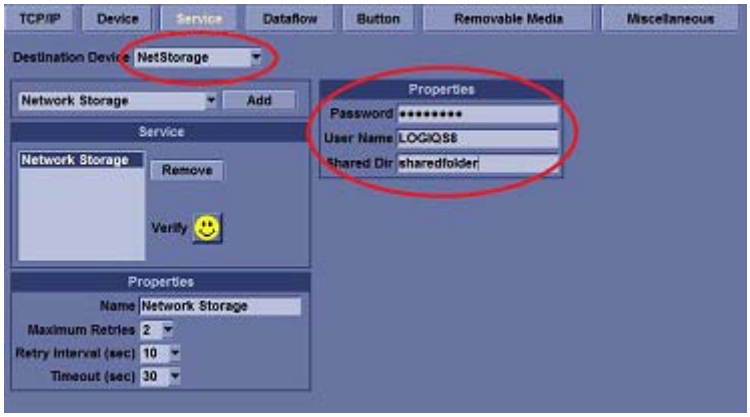
On the Device Tab, click “Add” enter New Device Name and IP Address. Click **Save**. Select Ping to verify the icon changes (smiley face appears).



2.) Select the Service Tab. The Destination Device displayed should be the Device that was created in the previous step, if not use the drop down arrow to select it.

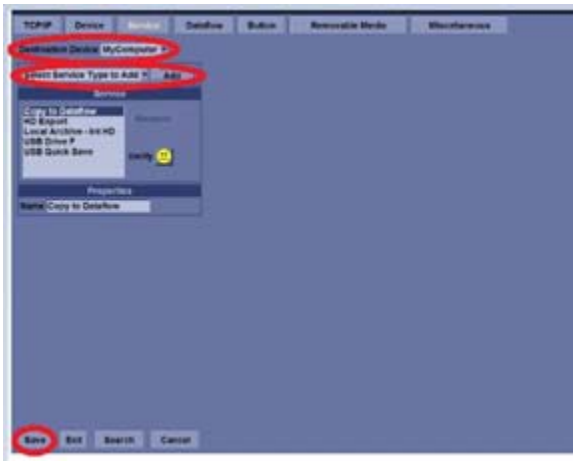
Select Service Type to Add, click the drop down and select Network Storage, then click “Add.”

For Properties, enter the Password, User Name and Shared Directory provided by the IT department for the Share that was created on the customer's computer, and then click **Save**.

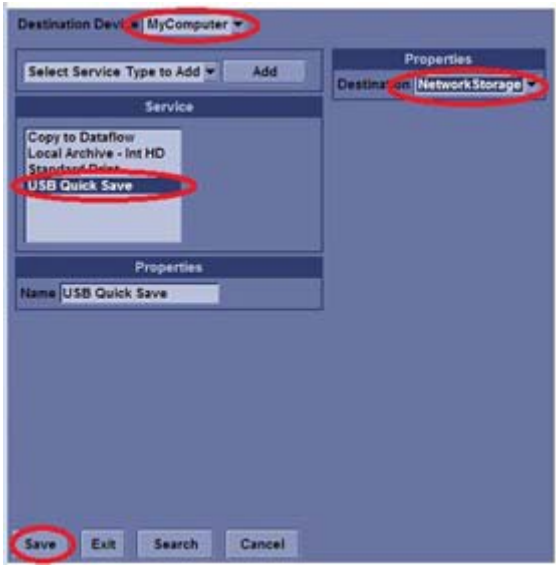


3-12-8 Instructions for setting up Network Storage on LOGIQ S8 R4 (cont'd)

3.) On the Service Tab, select the Destination Device, "My Computer" Select Service Type to Add, select USB Quick Save, then "Add." and then Save.

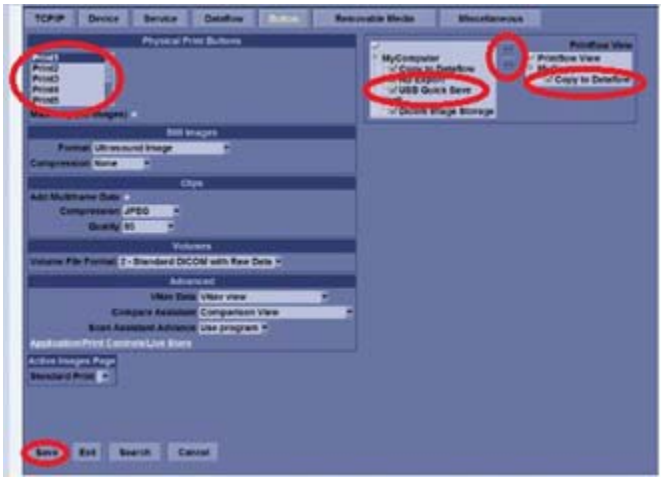


4.) Assign Network Storage to USB Quick Save under Destination Device, My Computer, on the Service Tab, select Destination Device My Computer, click on USB Quick Save, then click on the down arrow under Properties and select NetworkStorage, then click on **Save**.



3-12-8 Instructions for setting up Network Storage on LOGIQ S8 R4 (cont'd)

5.) Select Button Tab. Select a Print Button, then add the USB Quick Save to the Printflow View by selecting >>. If Copy to Dataflow is in PrintFlow View, remove by selecting <<, then click **Save**.



NOTE: It takes a long time to access Network Storage Service by the condition of the network.

Section 3-13
Setting up InSite Connection (R1 to R4)

3-13-1 Overview

System may be configured to connect to InSite server, which enables GE Service Personnel to connect to the system to monitor health of the system, perform diagnostics, exchange files, or view console desktop.

3-13-2 Contents in this section

3-13-3 Prerequisites for InSite Setup

1.) If not already available, collect the following information from the IT Administrator:

a.) System IP Address
_____/_____/_____/_____

b.) Default Gateway
_____/_____/_____/_____
Proxy Server, if necessary
_____/_____/_____/_____ and Port _____

c.) Proxy Authentication, if necessary
User _____ and Password_____ and Scheme.

d.) System ID (SID) number_____

3-13-4 Configuration Steps

1.) Complete 3-13-3 - Prerequisites for InSite Setup.

2.) Configure the system on the customer's network using the System IP Address and Gateway Address collected above.

NOTE: See the appropriate system Service Manual to configure the system to access the network.

3.) On the LOGIQ S8, access the Service Login screen via Utility -> Service. The Service Login screen opens.

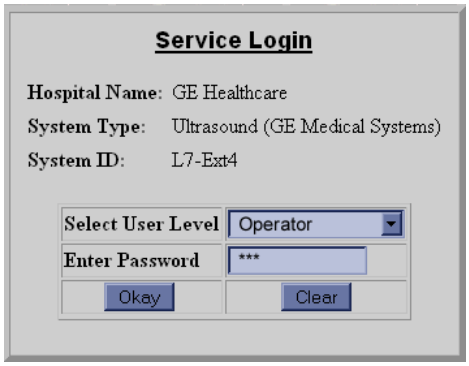


Figure 3-51 Service login window

4.) Select **GE Service** and enter the password, then select **Okay**. The Service Desktop opens. About the password, see 7-6-3 "Global Service User Interface (GSUI)" on page 7-25.

5.) Select the Configuration tab. The Configuration Page opens.

3-13-5 Configuring InSite

Configure the System to connect to InSite. All bold fields are mandatory. Before configuring the agent be sure that you have a network connection and check that it is configured. You will not be able to perform checkout with the default network configuration.

3-13-6 Configuring Agent Configuration

1.) Select the Configuration tab and choose the **InSite Agent Configuration** link in the frame on the left side.

2.) Inspect the Device Name field and the CRM field. The Device Name field auto populates with the prefix LS8_ followed by the Serial number.

NOTE: The Device Name cannot be edited.

3.) In the Serial Number/System ID (CRM) field (for Ultrasound), enter the System ID now.

This is a required field. For consoles located in the U.S.A., the System ID is pre-populated. Outside of the U.S.A., follow the local System ID convention.

The CRM field auto-populates with format of LOGIQ S8 followed with the first five (5) digits of the serial number. The CRM field is editable, and can be edited to reflect the desired System ID.

NOTE: If CRM says unknown, try rebooting. When you install software the system reboots, but you need a second boot to get the serial number into the service platform.

3-13-6 Configuring Agent Configuration (cont'd)

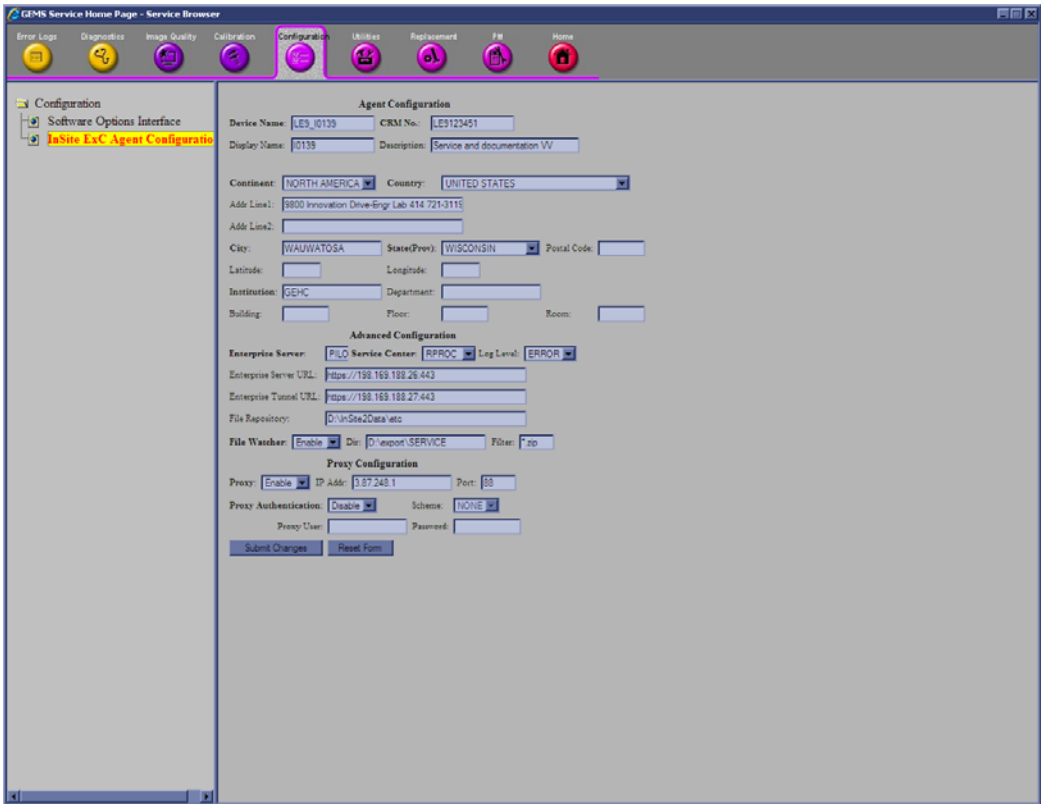


Figure 3-52 Configuration Home Page

4.) In the Display Name field, enter a descriptive name that is easy to identify with this device. For example, "Unit 1".

5.) In the Description field, create a unique description of the system. For example, "St. Mary's Hospital".

3-13-6 Configuring Agent Configuration (cont'd)

6.) Configure the following mandatory fields as desired:

- Continent
- Country
- City
- State
- Institution

The Agent Configuration Tool screen opens.

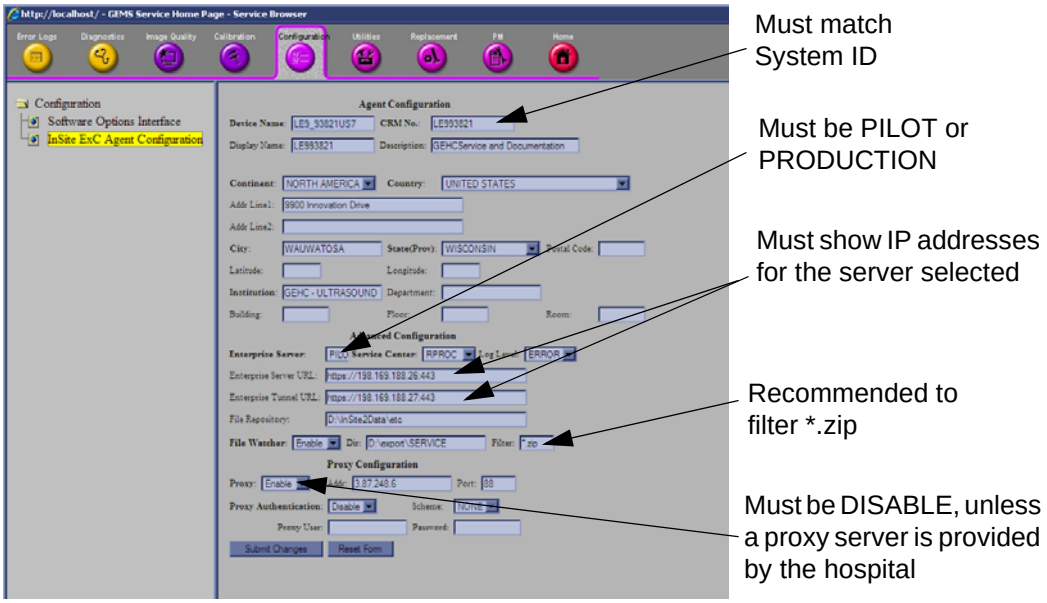


Figure 3-53 Completed Agent Configuration Tool screen

3-13-7 Configuring Advanced Configuration

1.) Select **PRODUCTION** from the **Enterprise Server** drop down list.
   - for Production, as shown below:
     * Enterprise Server URL = https://198.169.188.10:443
     * Enterprise Tunnel URL = https://198.169.188.11:443

2.) Configure the **Service Center** settings as RPROC.

3.) Select **Enable** in the File Watcher field.

NOTE: Do not change the Directory field.

4.) In the Filter field, it is recommended to set it to *.zip, so that the system will only upload zip files to the back office. Example, Alt D logs.

5.) If a proxy is needed, select **Enable** from the Proxy drop down list and enter a valid proxy server address and port (if needed).

If proxy authentication is needed:

a.) Enable it and enter Scheme (if needed).

b.) Enter User information and Password.

6.) Save the settings from the previous steps by clicking the **Submit Changes** button. A page is displayed on the CSD indicating the “agent will be restarted.”

If a screen requests ok for password, select **Yes**. The Submit Changes screen opens

.

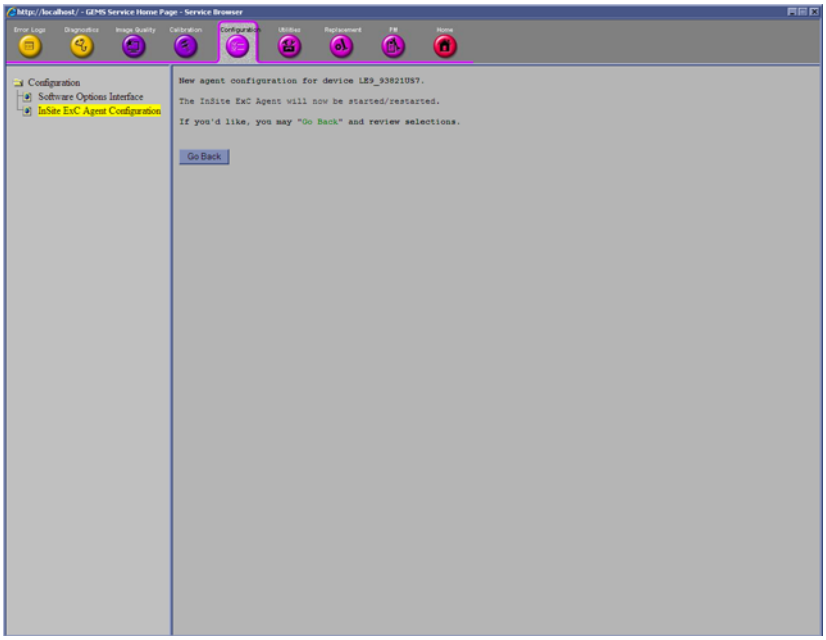


Figure 3-54 Submit Changes Response

3-13-7 Configuring Advanced Configuration (cont'd)

7.) Access and inspect the CSD Home Page. The Home Page appears and indicates Configured and Checked out.

If configured properly, the Service Home Page updates in approximately 10 seconds (although it may take up to 2 minutes). If it does not check out, confirm the Agent Configuration Tool screen has correct URL / IP address information. Make corrections, and repeat 1 Select **PILOT2** or **PRODUCTION** from the Enterprise Server drop down list. The Pilot server is used for initial production, please check with the OLC to verify that the current server is used. 3-50. If it fails again, contact the OLC or the Hospital IT department to check that your system has access to the Internet.

NOTE: If this fails wait a minute and refresh the page by clicking on the home page button again. There is often a delay before the checkout is complete.

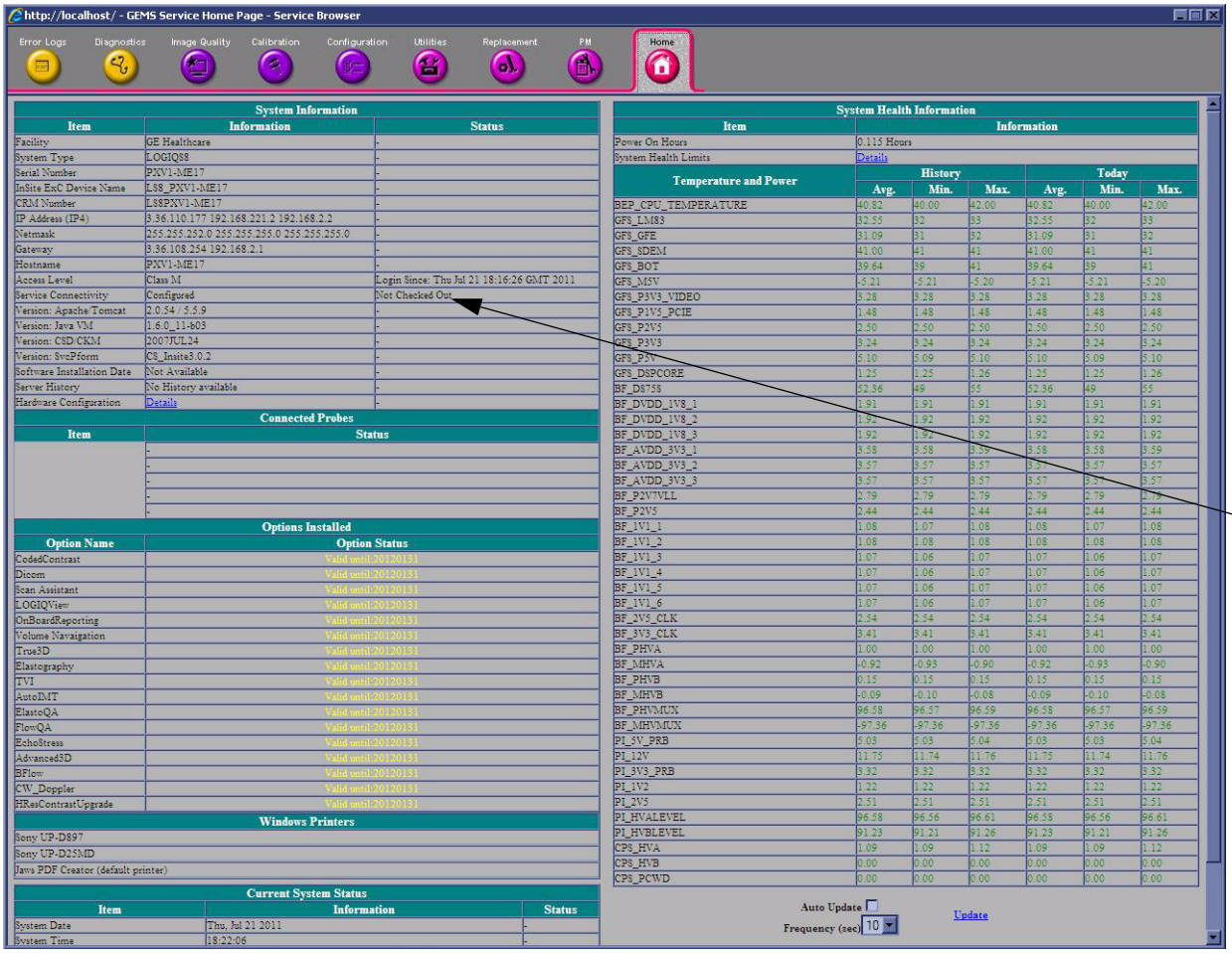


Figure 3-55 Configuration Home Page

For each of the parameters, enter appropriate values.

Table 3-13

	Mandatory	Values/Note
Device Name	Yes	Pre-populated. LS8 prefix plus console serial number
CRM No.	Yes	Arbitrary. Enter SYSTEM ID assigned by GE service (local system ID)
Display Name	No	Arbitrary. Enter Customer's system designation
Description	No	Arbitrary. Enter Customer's system designation
Continent	Yes	Select from dropdown menu
Country	Yes	Select from dropdown menu
Addr Line1	No	Arbitrary. Enter Customer's address
Addr Line2	No	Arbitrary. Enter Customer's address
City	Yes	Arbitrary. Enter Customer's address
State (Prov)	Yes	Arbitrary. Enter Customer's address
Postal Code	No	Arbitrary. Enter Customer's address
Latitude	No	Arbitrary.
Longitude	No	Arbitrary.
Institution	Yes	Arbitrary. Enter Customer's info
Department	No	Arbitrary. Enter Customer's info
Building	No	Arbitrary. Enter Customer's info
Floor	No	Arbitrary. Enter Customer's info
Room	No	Arbitrary. Enter Customer's info
Enterprise Server	Yes	Select "PRODUCTION" for install base Select "PILOT" for test purpose
Service Center	Yes	Remains the same "OTHERS"
Log Level	No	Remains the same "ERROR"
Server URL	No	Automatically populated when selecting Server
Tunnel URL	No	Automatically populated when selecting Server
File Repository	No	Remains the same "d:\InSite2Data\etc"
File Watcher	Yes	Remains the same "Enable"
Dir	No	Remains the same "d\Service"
Filter	No	Remains the same "*.*"
Proxy	Yes	Select from dropdown menu Consult institutions' IT personnel for Proxy settings
IP Addr	No	Consult institutions' IT personnel for Proxy settings
Port	No	Consult institutions' IT personnel for Proxy settings
Proxy Auth	Yes	Consult institutions' IT personnel for Proxy settings

Table 3-13

	Mandatory	Values/Note
Scheme	No	Consult institutions' IT personnel for Proxy settings
Proxy User	No	Consult institutions' IT personnel for Proxy settings
Password	No	Consult institutions' IT personnel for Proxy settings

3-13-8 Configuring Request for Service (RFS)

To configure the LOGIQ S8 to enable the customer to submit an RFS,

1.) Position the Windows pointer on the GE InSite icon at the bottom of the display.

2.) Press the right Trackball Set key. Select **Contact GE**. The RFS screen opens.

3.) Select the Users tab. Click on **Add Users** and type the site's Contact Name. Manual and machine-generated RFS requests are directed to this person. Items with red asterisks are required fields and must be filled in.

4.) Click on **Set Default Machine contact**.

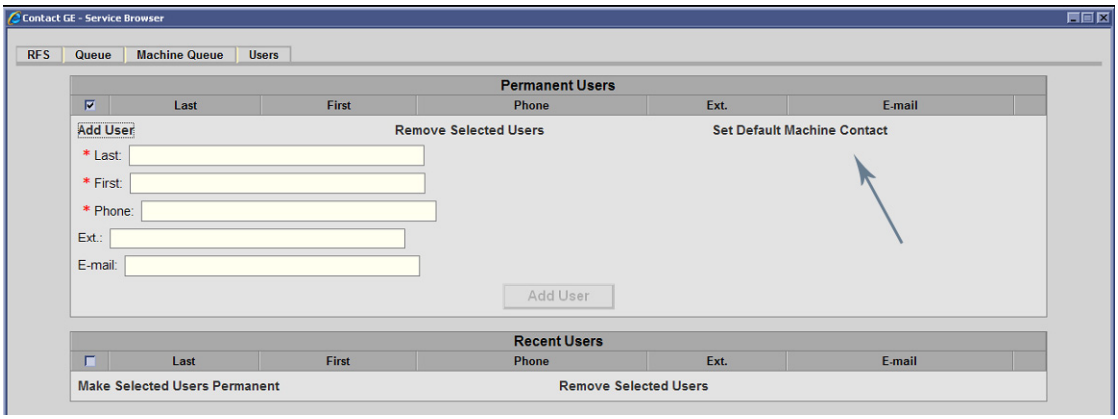


Figure 3-56 Users tab

NOTE: Machine-generated RFS is the system default. If you wish to disable RFS, remove the checkmark at Automatic Request for Service via Utility -> Admin -> System Admin.

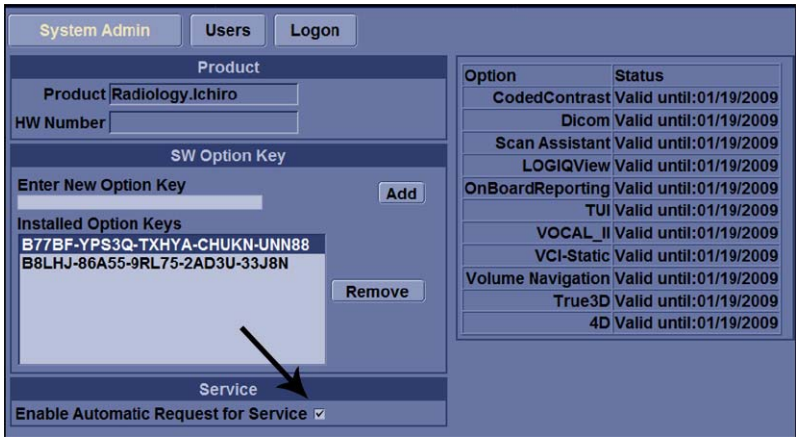


Figure 3-57 System Admin page

3-13-8-1 Remote Check and Configuration

Contact the OnLine Center for InSite Checkout confirmation.

3-13-9 Verifying InSite Connection - CSD

1.) From Remote PC, access InSite Agent.

Select target console from GROUP folder. LOGIQ S8 is found under folder:

"ROOT\CS_ULS_LOGIQ_S8_03.0" (R1.x.x),
"ROOT\CS_ULS_LOGIQ_S8_03.5" (R2.x.x/R3.x.x)
"ROOT\CS_ULS_LOGIQ_E8_03.5" (LOGIQ E8)

2.) Request the OLC to attempt to connect to the system via CSD and VNC.

3.) To speed up access rate, Position the Windows pointer on the GE InSite icon at the bottom of the display.

4.) Press the right Trackball Set key. Select **Connect to GE**.

Figure 3-58 Select Connect To GE

5.) Verify CSD desktop appears on the remote PC.

3-13-10 Verifying InSite Connection - VCO

1.) On the console, invoke **Disruptive Mode** and **VCO** by right click on the GE InSite icon at the bottom of the display and select **Connect Clinical Lifeline**.

Figure 3-59 Select Connect Clinical Lifeline

2.) Confirm with the OLC that the connection is established and they can perform VNC connectivity.

NOTE: Questra agent will be replaced by the RSVP Agent, but functionally is very similar. See below figure.

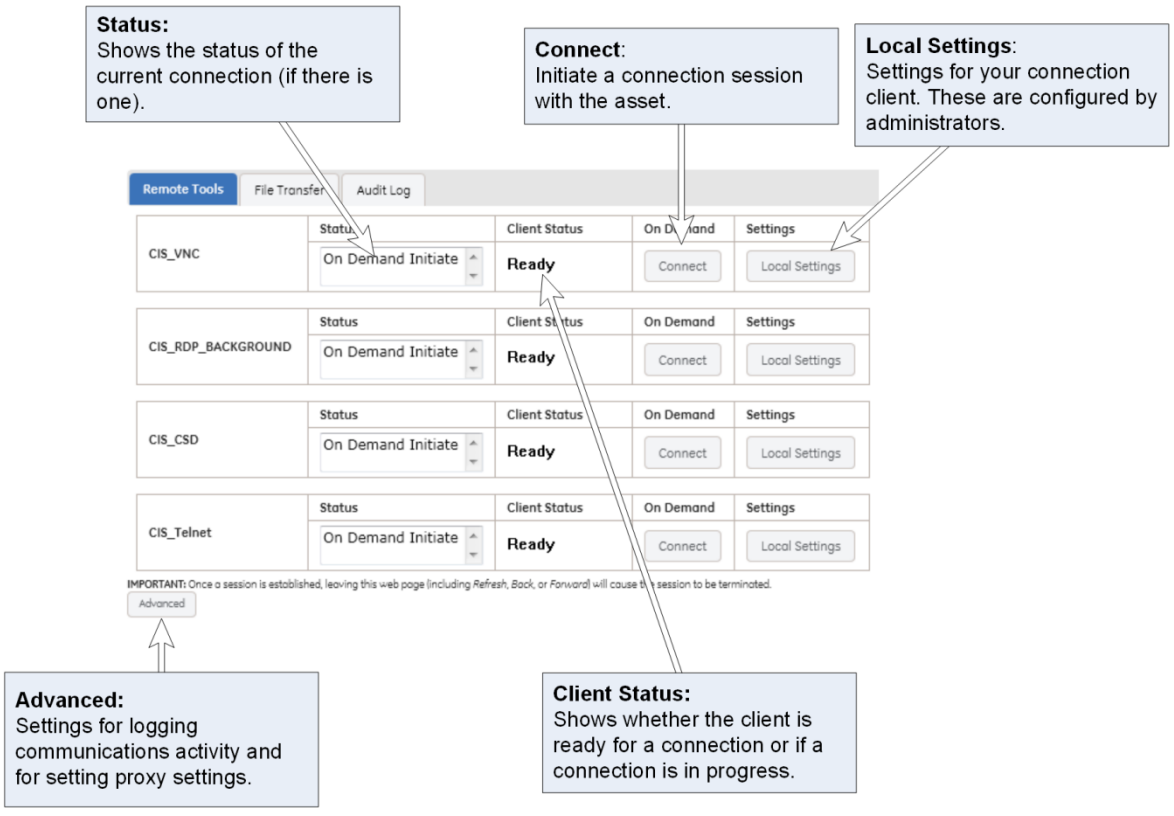


Figure 3-60 RSVP Interface

Section 3-14
Agent Configuration (R4.2.5x and later)

3-14-1 Overview

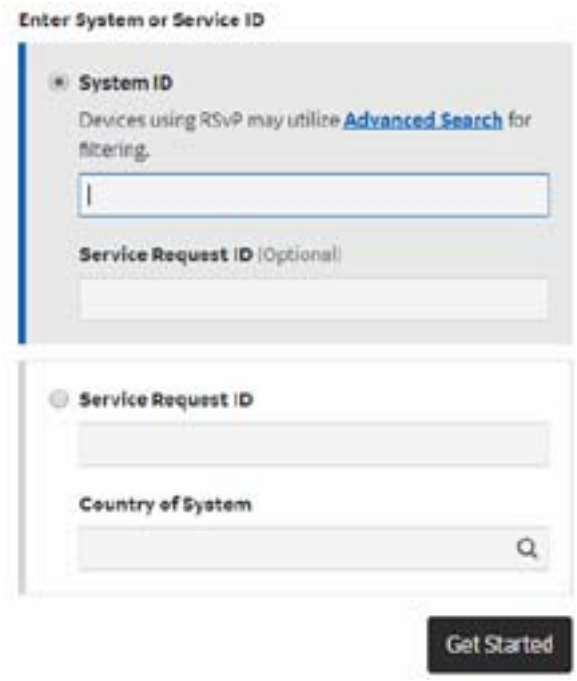
NOTE: Refer to 7-8-13 "Agent Configuration" on page 7-126 for InSite Configuration.

Be aware that the system may go in quarantine after upgrading to R4.2.5x due to the change to a new Device Type. Contact the On Line center to seek help for clearing up the quarantine status.

3-14-2 Verifying back office connection - CSD

1.) Login to FFA Site from Remote PC using Chrome web browser. As of 2018, FFA Site address is https://ffa.am.health.ge.com.

2.) In System ID field, type the CRM Number of the machine and select [Get Started].



3.) At CONNECT mode, Select [Connect] of the Service Desktop on Remote Console.

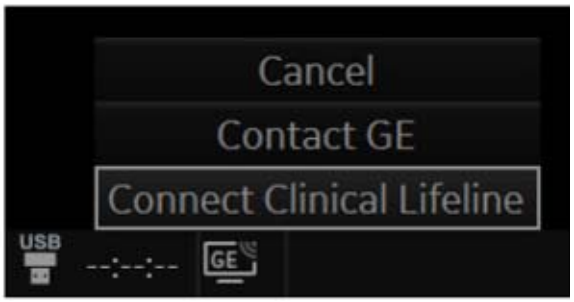
4.) After selecting [Connect] button, operator may need to wait long time to launch the remote service desktop.

5.) Verify Service Desktop appears on remote PC.

3-14-3 Verifying Back Office Connection - VOC

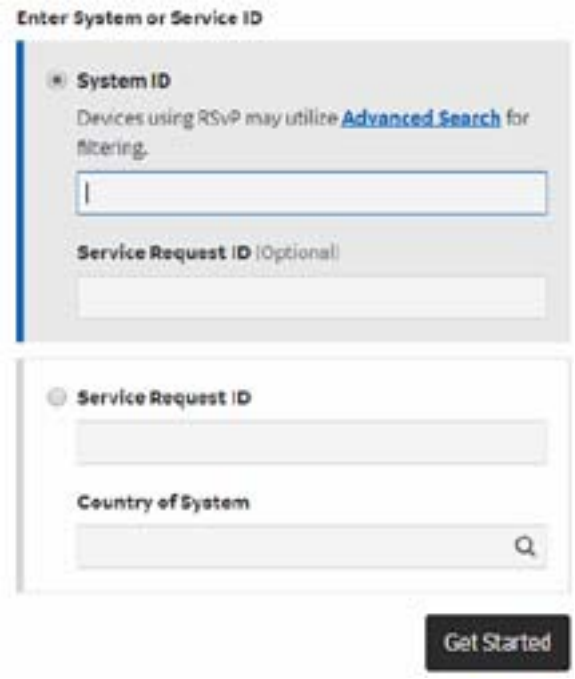
To enable disruptive mode or VCO, the user in front of the scanner has to have Remote service access rights. Otherwise the request for disruptive mode will be automatically denied.

1.) On Console, invoke “Disruptive Mode” and “VCO” by left click “GE ICON“ and select “Connect Clinical Lifeline”.



2.) Login to FFA Site from Remote PC using Chrome web browser. As of 2018, FFA Site address is https://ffa.am.health.ge.com.

3.) In System ID field, type the CRM Number of the machine and select [Get Started].



4.) At CONNECT mode, Select [Connect] of the Virtual Console on Remote Console..

5.) After selecting [Connect] button, operator may need to wait long time to launch the remote service desktop.

6.) Verify console desktop can be viewed from Remote PC.

Section 3-15
Connectivity Setup Worksheet

Site System Information

Site:

Dept:

LOGIQ™ S8
SN:

Type:

Floor:

Room:

REV:

Comments:

CONTACT INFORMATION

Name	Title	Phone	E-Mail Address

TCP/IP Settings

System IP Settings

Name - AE Title:

IP Address:

Subnet Mask:

Default Gateway:

Remote Archive Setup

Name - AE Title:

IP Address:

Subnet Mask:

Default Gateway:

Server Name:

Remote DB User Name:

Services (Destination Devices)

	Device Type	Manufacturer	Name	IP Address	Port	AE Title
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Section 3-15 Connectivity Setup Worksheet (cont'd)

LOGIQ™ S8

Host Name _____ Local Port _____ IP Address . . .

AE Title _____ Net Mask . . .

ROUTING INFORMATION

	Destination IP Addresses	GATEWAY IP Addresses
Default		. . .
ROUTER1	. . .	. . .
ROUTER2	. . .	. . .
ROUTER3	. . .	. . .

DICOM APPLICATION INFORMATION

	NAME	MAKE/REVISION	AE TITLE	IP ADDRESSES	PORT
Store 1				. . .	
Store 2				. . .	
Store 3D_1				. . .	
Store 3D_2				. . .	
Print				. . .	
Worklist				. . .	
Structured Reporting				. . .	
Storage Commit				. . .	
MPPS				. . .	

Figure 3-61 Worksheet for DICOM Network Information

Section 3-16
Paperwork

NOTE: During and after installation, the documentation (i.e. User Manual, Installation Manual,...) for the peripheral units must be kept as part of the original system documentation. This will ensure that all relevant safety and user information is available during the operation and service of the complete system.

3-16-1 Product Locator Installation Card

NOTE: The Product Locator Installation Card shown may not be same as the provided Product Locator card.

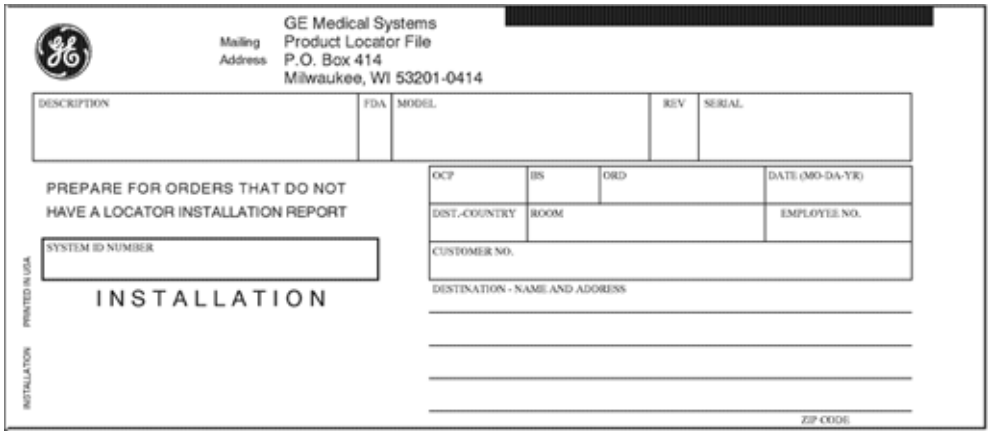


Figure 3-62 Product Locator Installation Card

3-16-2 User Manual(s)

Check that the correct User Manual(s) for the system and software revision, is included with the installation. Specific language versions of the User Manual may also be available.

Check with your GE Sales Representative for availability.

Chapter 4
Functional Checks

Section 4-1
Overview

4-1-1 Purpose of this chapter

This chapter provides procedures for quickly checking major functions of the LOGIQ S8 scanner and diagnostics instructions using the built-in service software.

4-1-2 Contents in this chapter

NOTICE Most of the information pertaining to this Functional Checks chapter is found in the Basic User Manual;

Section 4-2
Required equipment

- An empty (blank) CD-R, DVD-R, and/or external USB devices (Flash drive or hard disk drive).
- A blank DVD+RW disc for DVR recording (R1.x.x or R2.x.x).
- A blank DVD+RW or DVD-RW disc for DVR recording (R3.x.x or later).
- At least one probe (ideally you should check all the site probes used by the system.)
  For available probes, see *Section 9-13 "Probes" on page 9-59*.

Section 4-3
General procedures

CAUTION **SYSTEM REQUIRES ALL COVERS**
Operate this unit only when all board covers and frame panels are securely in place.
The covers are required for safe operation, good system performance and cooling purposes.

NOTICE Energy Control and Power Lockout for LOGIQ S8.

When servicing parts of the system where there is exposure to voltage greater than 30 Volts:

1. Complete shutdown the system.
2. Unplug the system.
3. Maintain control of the system power plug.
4. Wait for at least 20 seconds for capacitors to discharge as there are no test points to verify isolation.

Beware that the Power Supply, Front End Processor and Back End Processor may be energized even if the power is turned off when the cord is still plugged into the AC Outlet.

4-3-1 Power ON

NOTE: The mains outlet of the system for peripheral auxiliary equipment are commonly switched with the ON/OFF standby button. So the auxiliary equipment need not to be switched ON/OFF separately.

1.) Switch ON the Mains Power Circuit Breaker at the rear of the system. The power button turns on a light as blue.

2.) Press once the power button on the Operator Control Panel to boot the system. The power button turns on a light as green.

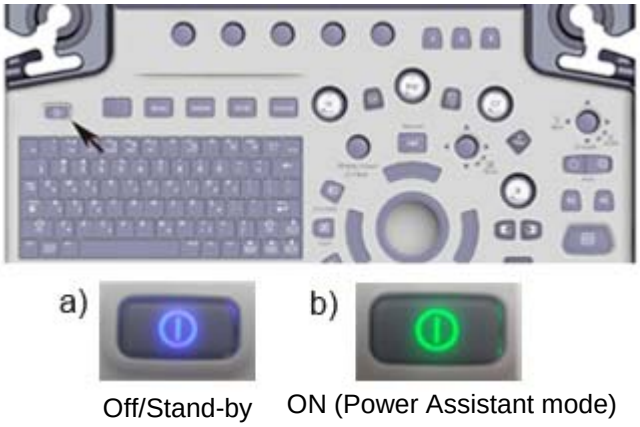


Figure 4-1 Power Button

3.) The System (including the Back-end Processor) starts and the operating system is loaded which then leads the application software to activate the scanner.

During a normal boot, you may observe

- Power is distributed to Peripherals, Operator Panel (control panel), Monitor, Front-End and Back-End Processor.
- The Back-End Processor and rest of the scanner starts with the sequence listed in following steps:

  a.) “Boot Screen” is displayed.

  b.) Back-End Processor is turned ON and starts to load the software.

  c.) The Start Screen is displayed on the monitor.

  d.) Start-up progress bars indicating software loading procedures, are displayed on the monitor.

  e.) The software initiates and sets up the Front-End electronics and the rest of the scanner (incl. the clicking sound of the relays on the PID board).

  f.) The Keyboard backlight is lit.

4.) As soon as the software has been loaded, the system enters B-Mode with the probe connected to port nearest to a user. Total time used for start-up is about 2 minutes. The power button on the Control Panel and indicator color.

4-3-2 Login

At login, you are notified that “You are accessing a diagnostic medical device that is provided by authorized usage only. Data stored on this device may be subject to various regulations including but not limited to regulations which govern disclosure and privacy of this data. By using this device you are acknowledging that you are authorized to do so and are trained in appropriate use and regulatory guidelines.”

NOTICE The System Administrator manages system groups, users, and permissions. After you have been added as a valid user, the System Administrator assigns you a temporary password. When you log into the system for the first time, you will be prompted to change your password.

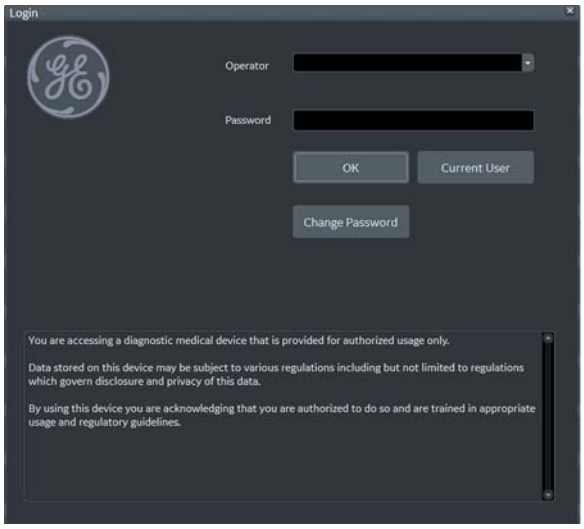


Figure 4-2 Login Window (Example of R4.2.5x)

After you have established your password, follow these steps to login.

1.) Type your user name in the **Operator** field.
2.) Type your password in the **Password** field.
3.) Press **OK** to login, or **Cancel** to cancel login.

4-3-3 Logoff/Shutdown/Exit

1.) When you lightly press the **Power On/Off** switch once. The System-Exit window is displayed.

System Exit Window - R1

System Exit Window - R2 and later

2.) The SYSTEM - EXIT menu, used when power off the unit, gives you these choices:

- **Logoff**

  Use this button to log off the current user. The system remains ON and ready for a new user to log on. If the Logoff button is dimmed, it indicates that no user is logged on to the unit at the moment.

- **Shutdown**

  Use this button to shut down the system. The entire system will shut down. The power button turns on blue indicated Standby- mode (refer to Figure 4-1 "Power Button" on page 4-3).

  For the system with R4.2.5x and later, press Power On/Off button three (3) times to shutdown.

NOTE: If the system has Small/Extended battery (Option), the system automatically starts battery-charging when goes to Standby-mode.

- **Cancel**

  Use this button to exit from the System-Exit menu and return to the previous operation.

- **Exit** (Only available when logged in as GE Service with Service Dongle)
- **Sleep (R1 to R4)**

  Select this button to go to SLEEP mode. Refer to 3-7-6 "Sleep Mode (R1 to R4)" on page 3-23.

4-3-4 Complete shutdown

NOTICE After turning off the system, wait at least 10 seconds before turning it on again. The system may not be able to boot if power is recycled too quickly.

NOTE: The mains outlet of the system for peripheral auxiliary equipment are commonly switched with the power button. So the auxiliary equipment need not to be switched ON/OFF separately.

1.) Enter the scan screen and lightly press the **Power On/Off** switch once. The System-Exit window is displayed.

2.) Select **Shutdown**. The system performs an automatic full shutdown sequence.

NOTICE The system will go to Power Assistant Mode (Optional, R2 or later) if above procedures are skipped.

NOTICE Be sure to wait with the next step until the system has finished its shut-down. Failing to do so may destroy data on the Hard Disk Drive, making the system fail later.

3.) Switch OFF the Circuit breaker on the rear panel of the system.

4.) After complete power down, disconnect the main power cable from the system or unplug it from the AC wall outlet socket.

WARNING ***Confirmation of LED status is necessary when repairing the system.***

Confirm the Power Status LEDs are OFF.
- If the LEDs are turned ON, attempt to shut down the system again.
- If unable to turn off the system, press and hold the Power on/off button to force shutdown.

NOTE: For R4 or later system with Extended Battery option, the extended battery is charged when the LOGIQ S8 in Standby-mode. While battery charging, LED is blinking and main fan is operating. But you can turn off the circuit breaker and disconnect the power cable when the battery is charging.

4-3-5 Monitor Positions Adjustment

CAUTION **To avoid injury or damage, make sure nothing is within the range of motion before moving the monitor and monitor arm. This includes both objects and people.**

4-3-5-1 Monitor operating range

1.) Grab the monitor frame with both hand.

2.) Verify can be tilted and rotated.

Figure 4-3

19” LCD Monitor	23” Wide Monitor	22” Wide Monitor
• Position up/down: +/- 7.5 cm • Position left/right: +/- 18cm • Rotation up/down: +90°/-15° • Rotation left/right: +/- 90°	• Position up/down: +/- 6.6cm • Position left/right: +/- 13.5cm • Rotation up/down: +90°/-15° • Rotation left/right: +/- 89°	• Position up/down: +/- 6.6cm • Position left/right: +/- 15cm • Rotation up/down: +90°/-15° • Rotation left/right: +/- 89°

4-3-5-2 Monitor Arm Lock

1.) Unlock the monitor arm.
2.) Verify the monitor can move up/down (vertically) and left/right (horizontally).
3.) Align the monitor arm along center line of the system.
4.) Engage the monitor arm LOCK.
5.) Verify the monitor arm is locked and the does not move.

.

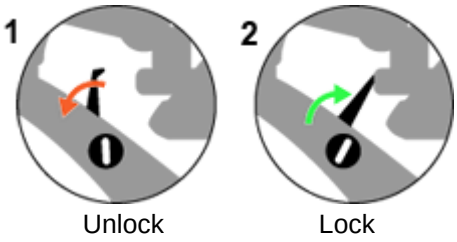


Figure 4-4 Monitor Arm Lock

4-3-6 Operator panel position adjustment

CAUTION **To avoid injury or damage, make sure nothing is within the range of motion before moving the operator panel. This includes both objects and people.**

4-3-6-1 To raise/lower the operator panel

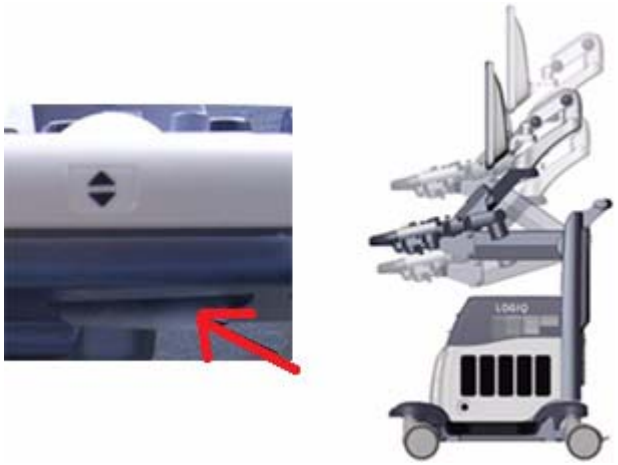


Figure 4-5 Elevation Lock Lever (R1 - R3 System)

Figure 4-6 Elevation Lock Lever (R1 - R3 System)

1.) Hold the elevation lock lever under the operator panel.
2.) Up or Down the operator panel (while holding lever).
3.) Verify the operator panel is free to up/down.
4.) Release the elevation lock lever (disengage).
5.) Verify the operator panel does not up/down.

NOTICE Do NOT attempt to apply excessive rotating force to the operator panel. The elevation brake is designed to hold the operator panel in desired position during normal use, and not meant to completely fix the operator panel position.

4-3-6-2 To move the operator panel from side to side

NOTE: The operator panel can rotate approximately 15 degrees to each side.

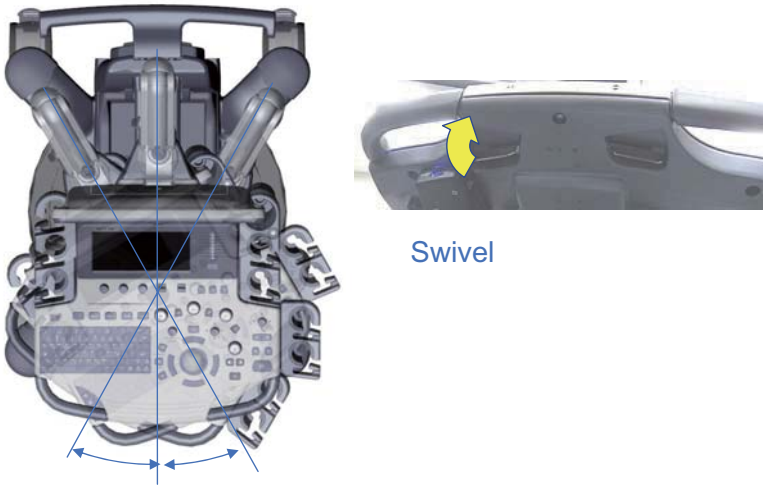


Figure 4-7 Swivel Lock Lever (R1 - R3 system)

Figure 4-8 Swivel Lock Lever (R4 system)

1.) Hold Swivel Lock lever under the operator panel.
2.) Rotate the operator panel (while holding lever).
3.) Verify the operator panel is free to rotate.
4.) Release the swivel lock lever (disengage).
5.) Verify the operator panel does not rotate.

NOTICE Do NOT attempt to apply excessive rotating force to the operator panel. The swivel brake is designed to hold the operator panel in desired position during normal use, and not meant to completely fix the the operator panel position.

4-3-7 Caster

CAUTION **The system weighs approximately 100 kg (LOGIQ S8) / 113 kg (LOGIQ E8) with the peripherals. Pay attention for system stability when working with the casters.**

4-3-7-1 Swivel/Brake Lock Caster

NOTE: This procedure applies to RIGHT REAR Caster only.

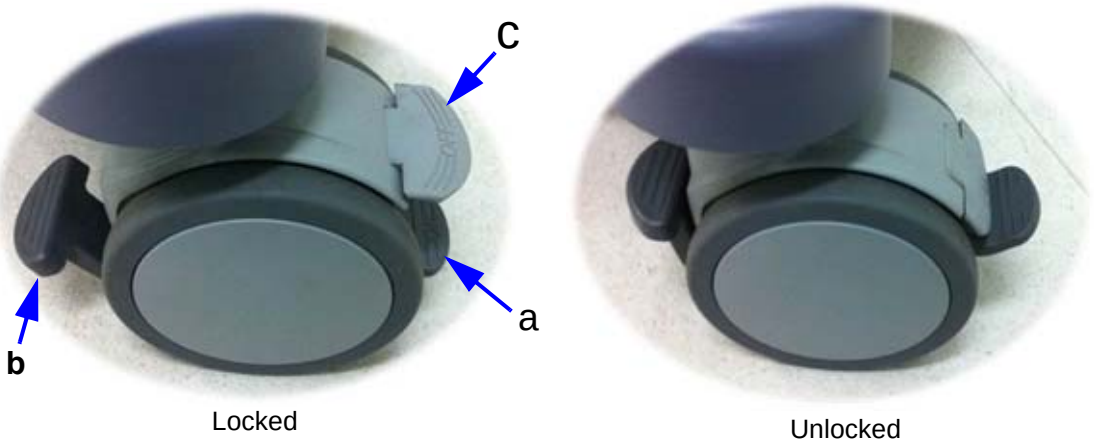


Figure 4-9 Right Rear Caster

1.) Press ‘a’. (see: Figure 4-9)
2.) Rotate wheel until it locks (only one lock position in 360 deg turn).
3.) Verify Swivel Lock engages.
4.) Press ‘b’ downward. (see: Figure 4-9)
5.) Verify Brake is applied to the wheel. (i.e. Wheel does not rotate)
6.) Press ‘b’ upward.
7.) Verify Brake is released.
8.) Press ‘c’. (see: Figure 4-9)
9.) Verify Swivel is released.

4-3-7-2 Total Lock Caster

CAUTION **The system weighs approximately 100 kg (LOGIQ S8) / 113 kg (LOGIQ E8) with the peripherals. Pay attention for system stability when working with the casters.**

NOTE: This procedure applies to casters except RIGHT REAR Caster.

Figure 4-10 Total Lock Casters

1.) Press ‘a’. (see: Figure 4-10)
2.) Rotate wheel until it locks (several locations where caster engages).
3.) Verify Swivel Lock engages and Brake is ON.
4.) Press ‘b’. (see: Figure 4-10).
5.) Verify wheel is free to move.

4-3-8 Moving and Transporting the LOGIQ S8

4-3-8-1 Before moving the system

When moving or transporting the system, follow the precautions below to ensure the maximum safety for personnel, the system, and other equipment.

CAUTION **When the system is not in use AND/OR before moving/transporting the system, make sure that the control panel/the monitor arm lock firmly and flip down the monitor to prevent system damage.**

CAUTION **DO NOT place probes or the footswitch into the side tray when moving/transporting the system. It is not storage space for probes, footswitch and any peripheral devices.**

CAUTION **If you park the system on a slippery slope, you MUST use the brakes on the wheel.**

CAUTION **This equipment is not to be used during transportation (e.g. ambulance cars, aircraft).**

CAUTION **DO NOT attempt to move the console using any cables or fixtures, such as the probe connectors.**

CAUTION **Handle carefully. A drop of more than 5 cm can cause mechanical damages.**

4-3-8-1 Before moving the system (cont'd)

1.) Adjust the monitor and control panel using Up/Down control and Swivel control to their centered and lowest positions. Refer to 4-3-6-1 To raise/lower the operator panel and 4-3-6-2 To move the operator panel from side to side.

2.) Flip down the monitor and lock the monitor arm.

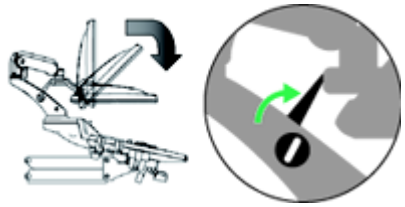


Figure 4-11 Flip down the monitor and lock the monitor arm

Figure 4-12 Moving/Transporting position

3.) Turn the system off, including the circuit breaker (see Section 3-7 "Power On/Off" on page 3-17), and remove the plug from the wall.

4.) All cables from off-board peripheral devices must be disconnected from the console.

5.) Disconnect the footswitch from the console.

6.) Wind the power cable around the cable hook.

*NOTE: To prevent damage to the Power Cord, **DO NOT** pull excessively on the cord or make sharp bends while wrapping.*

7.) Connect all probes to be used while off site. Ensure that probe cables are out of the way from the wheels and not protruding beyond the console. Use the probe management hooks located below the Operator Panel to further secure the probe cables.

8.) Store all other probes in their original cases or in soft cloth or foam to prevent damage.

9.) Put the coupling gel in the gel holder.

10.) Ensure that no loose items are left on the console and unlock the wheels.

4-3-8-2 Moving the system

1.) The system weighs approximately 85 kg (LOGIQ S8) / 97 kg (LOGIQ E8), depending on which peripherals are loaded onto the system. To avoid possible injury and equipment damage:

- Ensure that the operator control panel and LCD monitor are in locked position.
- Be sure the pathway is clear.
- Limit movement to a slow careful walk.
- Use two or more persons to move the system on inclines or long distances.

2.) Grasp the rear handle bar and push the system.

NOTE: The swivel lock on the left-rear caster helps control the system while moving.

Moving the system, no incline	Moving the system on incline
	

- Take extra care when moving the system long distances and on inclines (>5 degrees). Ask for help if necessary.
- DO NOT attempt to move the console using any cables or fixtures, such as the probe connectors.
- DO NOT attempt to move the system by pulling cables or belts placed around the monitor and/or monitor arm.
- Use the foot brake (pedal) when necessary.
- Avoid ramps that are steeper than ten degrees to avoid tipping over the system.

NOTE: Wheel chair ramps are usually less than five degrees.

- Utilize additional care and personnel when loading into a vehicle for transport.
- Do not let the system strike walls or door frames.
- Use extra care when crossing door or elevator thresholds.

NOTE: When you cross the threshold with the LOGIQ S8, move quickly.

3.) Once the destination is reached, lock the wheels.

4-3-8-3 Transporting the System

Use extra care when transporting the system using vehicles. In addition to the instructions used when moving the system (see 4-3-8-1 "Before moving the system" on page 4-13), also perform the following:

- Only use vehicles that are designed for transport of the system.
- Ensure that the transporting vehicle can handle the weight of the system plus the passengers.
- Employ two to three persons to load and unload safely from a vehicle.
- Ensure that the load capacity of the lift (a minimum of 85 kg (LOGIQ S8)/97 kg (LOGIQ E8) is recommended) is capable of handling the weight of the system.
- Ensure that the lift is in good working order.
- Secure the system with straps or as directed otherwise to prevent motion during transport.
- Prevent vibration damage by driving cautiously. Avoid unpaved roads, excessive speeds, and erratic stops or starts.

WARNING ***NEVER RIDE ON THE LIFT WITH THE SYSTEM. A PERSON'S WEIGHT COUPLED WITH THE WEIGHT OF THE SYSTEM MAY EXCEED THE LOAD CAPACITY OF THE LIFT.***

Load the system onto a vehicle

1.) Load and unload the system to a vehicle parked on a level surface.

2.) Secure the system while it is on the lift so that it cannot roll. Use either wood chocks, restraining straps, or other similar types of constraints. Do not attempt to hold it in place by hand.

3.) Load the unit aboard the vehicle carefully and over its center of gravity. Keep the unit still and upright.

NOTE: Do not lay the unit down on its side.

4.) Ensure that the unit is secured inside the vehicle. Strap the system with belt to prevent movement while in transit. Twist the belt around the rear handle (1) and the footrest/caster (2).

NOTE: DO NOT restrain the LOGIQ S8 at the LCD monitor or the monitor neck using a belt.

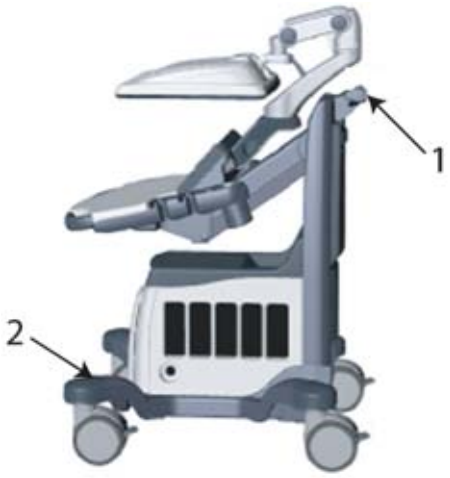


Figure 4-13 Wrapping position of the belt

5.) Drive cautiously to prevent vibration damage.

4-3-8-4 Setting up at a new location

1.) When the unit is in place at a new location, lock the wheel brakes.

2.) Follow the set up procedure described in *Section 3-6 "Completing the Set Up" on page 3-12*.

4-3-9 Service Platform Confirmation (R1 to R4)

1.) From the touch panel, select **Utility** -> **Service**.

2.) On Service Browser, select GE Service, and enter the password (See Section 7-6 "Service Desktop (CSD) - R1 to R4" on page 7-24 for details).

3.) Note “SvcPform” version.

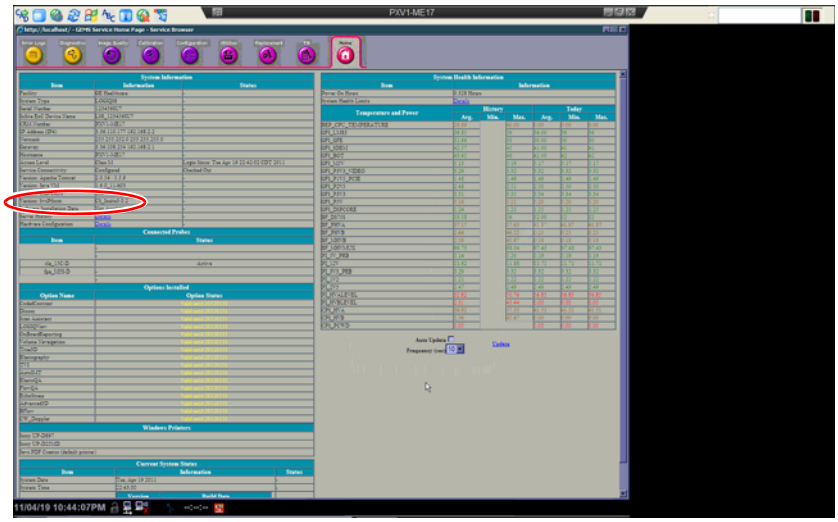


Figure 4-14 Service Platform version

Section 4-4
Functional Checks

4-4-1 Overview

In this section, the functional checks for LOGIQ S8 are described. Functional checks are used to verify that the product works as intended. Functional checks may also be used during troubleshooting.

4-4-2 Contents in this section

4-4-3 Preparation

Turn on the LOGIQ S8. For detailed description, see: Section 3-7 "Power On/Off" on page 3-17.

4-4-4 Basic Controls

4-4-4-1 Control Panel Map

Figure 4-15 Control Panel - R1, R2 and R3

1.Power On/Off
2.A/N Keyboard
3.Measurement Selection Menu
4.Rotary and Joystick controls
5.TGC
6.Reverse key
7.User Define keys
8.BT Keys
9.Mode/Gain/XYZ Controls
10.Trackball/Trackball Keys
11.Zoom
12.Measure key
13.Body Pattern/Ellipse
14.Comment key
15.Clear key
16.Pointer key
17.Left/Right key
18.P1 (Print) key
19.Steer/Width/Depth
20.Auto (AL and AR)
21.P2 and P3 key
22.Freeze key

Figure 4-16 Control Panel Map - R4

1. Power button
2. USB Port x 2 (USB3.0)
3. Touch Panel
4. TGC
5. Reverse key
6. Rotary and Joystick controls
7. User Define keys
8. BT Keys
9. F1: Access Online help/user manual
10. F2: Annotation Arrow
11. F3: Eject media
12. F4: Activates DICOM Job Spooler screen
13. F5: Creates a Fast Key
14. F6: Plays a Fast Key
15. F7: Home/Set Home
16. F8: Text1/Text2
17. F9: Grab last
18. F10: Word delete
19. Tab key
20. M-Mode
21. CW Doppler (Option)
22. PW Doppler
23. PDI/TVI (Option)
24. Color Flow
25. B-Flow (Option)
26. B-Mode
27. Joystick: Depth, Steer, Width
28. Arrow
29. Clear
30. Comment
31. Bodypattern/Ellipse
32. Measure
33. Zoom
34. Trackball and Trackball keys.
35. Auto Optimize
36. L/R key
37. Freeze key
38. Print keys
39. Keyboard rotation
40. Keyboard up/down

4-4-4-2 Trackball Area

Different functions can be assigned to the trackball depending on the current active mode. The trackball functions are organized in functional groups. The trackball functional groups are displayed in the lower right corner of the screen. Each group can have one or more controls that can be selected using the keys on the trackball area as described below. The Trackball area consist of:

- The Trackball: used as a cursor control in acquisition mode, scrolling control in freeze and as a selection tool (like a mouse cursor) in post-processing mode.
- The Set keys (Left/Right): Perform the selected control or highlighted menu item.
- The Trackball key (Upper/beneath): Toggles between the available trackball function assignments displayed in the Status bar.

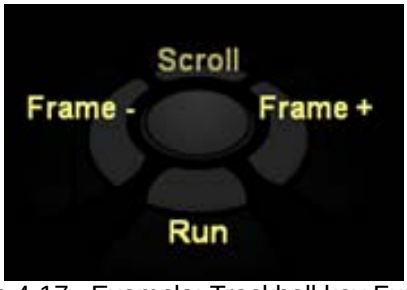


Figure 4-17 Example: Trackball key Function

- User defined trackball key (for R4 and later system): Toggles between the user defined trackball function.

Figure 4-18 Example: R4 Trackball key and Trackball mapping display area

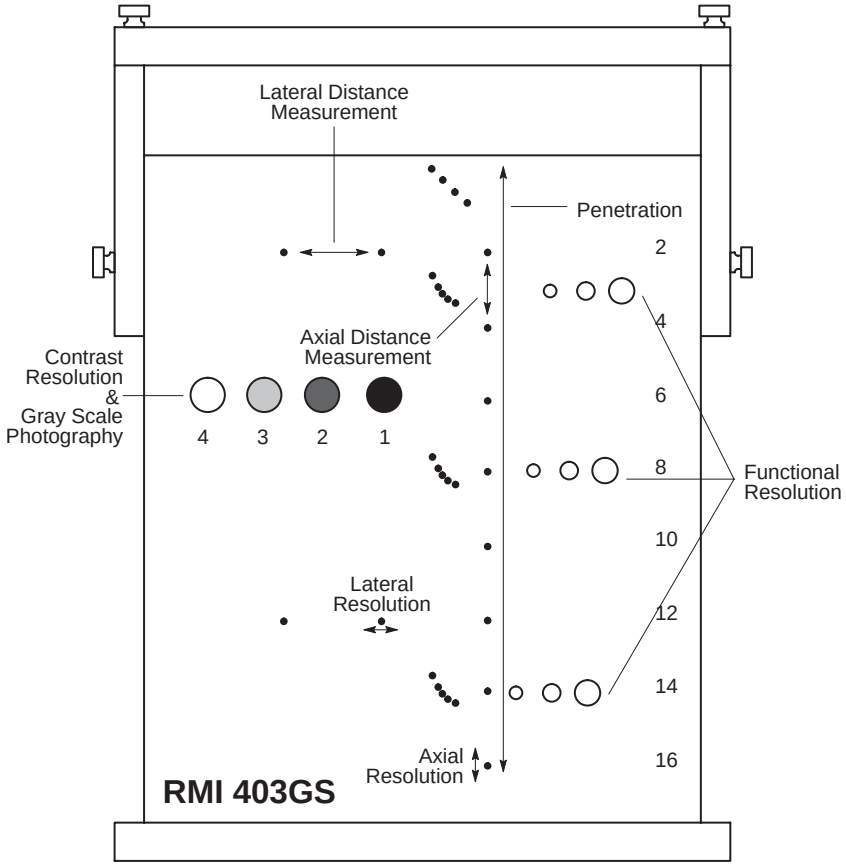
4-4-5 Performance Tests

The use of test phantoms is only recommended if required by your facility's (customer's) QA program.

4-4-5-1 Recommended Test Phantoms (optional)

GE Healthcare recommends the RMI 430GS phantom (optional), but it is not required. It is the most current phantom (optional) recommended to our field service personnel and provides the necessary targets and extended life necessary for consistent system testing.

Figure 4-19 Performance tests



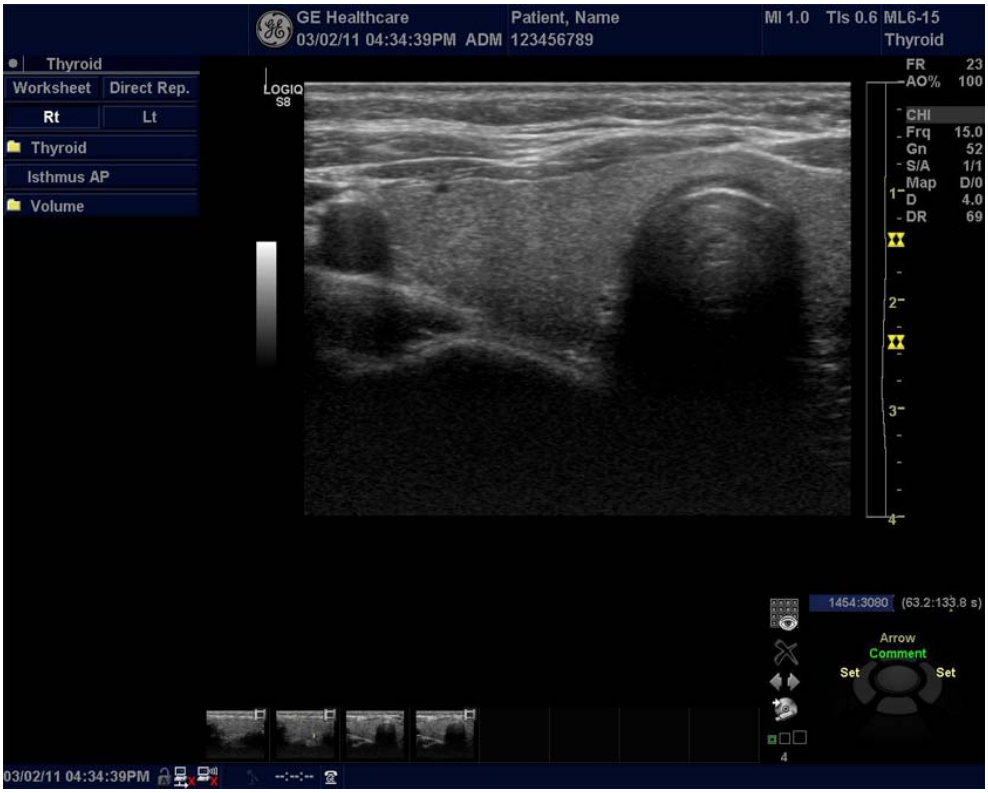
4-4-6 B-Mode Checks

For information on the system's different modes as well as expected results, refer to the latest revision of the Basic User Manual, Chapter 5.

4-4-6-1 Introduction

The B-mode is the system's default mode.

Figure 4-20 B-mode Screen Example



4-4-6-2 Preparations

Use a phantom (optional) when doing these tests.

1.) Connect one of the probes, to the scanner's active probe connector.
   - see: 3-6-4 "Connecting Probes" on page 3-15 for info about connecting the probes.
   - For available probes, see: Section 9-13 "Probes" on page 9-59.

2.) Turn ON the scanner. The B-Mode window is displayed (default mode).

3.) If needed, adjust the Display's Brightness and Contrast setting (see: *Section 6-2 "Monitor Adjustment" on page 6-2*).

WARNING ***ALWAYS USE THE MINIMUM POWER REQUIRED TO OBTAIN ACCEPTABLE IMAGES IN ACCORDANCE WITH APPLICABLE GUIDELINES AND POLICIES.***

4-4-6-3 Checks

1.) Press **B-Mode** on the Operator Panel to access B-Mode.

2.) These Image Controls are used to optimize the B-Mode picture:
   - Use **Gain** and **TGC** controls to optimize the overall image together with the **Power** control.
   - Use **Depth** to adjust the range to be imaged.
   - Use **Focus** to center the focal point(s) around the region of interest.
   - Use **Frequency** (move to higher frequencies) or **Frame rate** (move to lower frame rate) to increase resolution in image.
   - Use **Frequency** (move to lower frequency) to increase penetration.
   - Use the control to optimize imaging in the blood flow regions and make a cleaner, less noisy image.
   - Use **Reject** controls to reduce noise in the image.

- Check Width, Focus, Frame rate, Frequency
  The results of these adjustments must be verified on the B-Mode sector on the screen.
- Check Rotation (Up/Down), Reverse (Left/Right), B Color Maps and Cineloop
  The results of these adjustments must be verified on the B-Mode sector on the screen.
- Check Gain, TGC and Depth
- Check B-Mode Soft Menu Controls
- Check Compress, Contour, Reject and Tilt
- Check Acoustic output power and Dynamic Range

4-4-7 M-Mode Checks

For information on the system's different modes as well as expected results, the Basic User Manual or User Guide will familiarize you with image optimization for **B-Mode**, **M-Mode**, **Color Flow**, and **Doppler**.

Table 4-1 B/M-Mode Functions

Control	Description
Power Output (Acoustic Power)	Optimizes image quality and allows user to reduce beam intensity. 10% increments between 0-100%. Values greater than 0.1 are displayed
Dynamic Range	Controls how echo intensities are converted to shades of gray, thereby increasing the adjustable range of contrast.
Focus Number and Position	Increases the number of transmit focal zones or moves the focal zone(s) so that you can tighten up the beam for a specific area. A graphic caret corresponding to the focal zone position(s) appears on the right edge of the image.
Rejection	Selects a level below which echoes will not be amplified (an echo must have a certain minimum amplitude before it will be processed).
Frame Average	Temporal filter that averages frames together. This has the effect of presenting a smoother, softer image.
Colorize	Enables gray scale image colorization. To deactivate, reselect a Gray Map.
Gray Map	Determines how the echo intensity levels received are presented as shades of gray.
Rotation (Up/Down)	Rotates the image by selecting the value from the pop up menu.
Frequency	Multi Frequency mode lets you downshift to probe's next lower frequency or shift up to a higher frequency.
Frame Rate/Resolution	Optimizes B-Mode frame rate or spatial resolution for the best possible image.
Sweep Speed	Changes the speed at which the timeline is swept.

4-4-7-1 Preparations

Use a phantom (optional) when doing these tests.

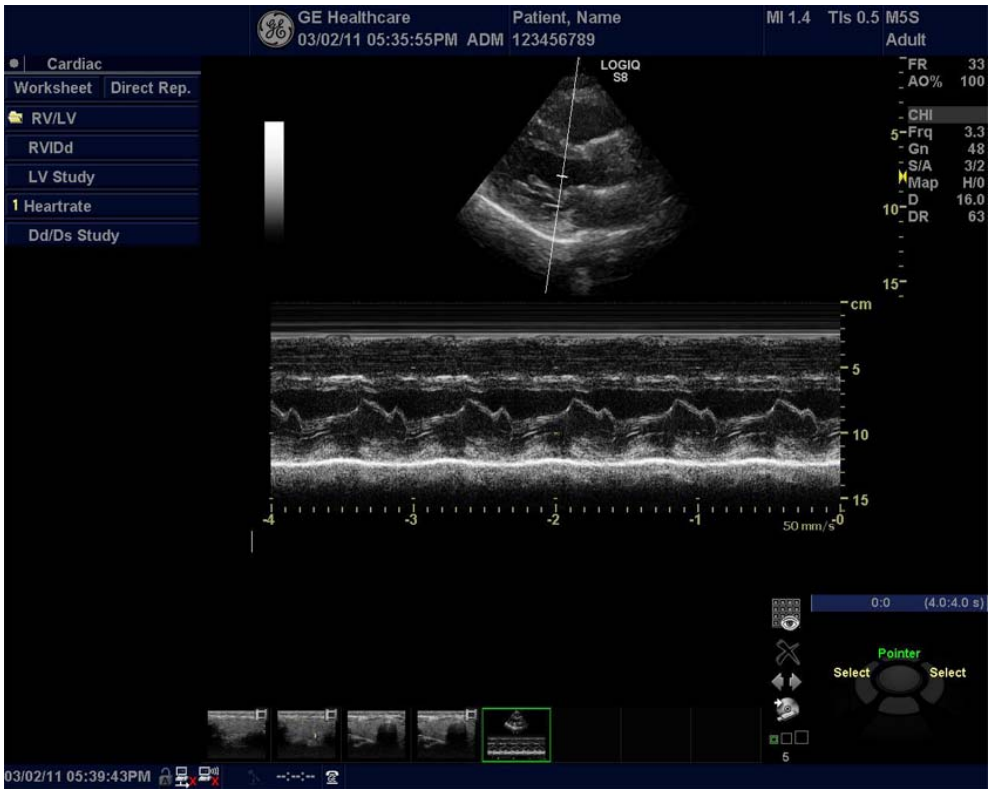
1.) Connect one of the probes, to the scanner's active probe connector.
   - see: 3-6-4 "Connecting Probes" on page 3-15 for info about connecting the probes.
   - For available probes, see: Section 9-13 "Probes" on page 9-59.

2.) Turn ON the scanner. The B-Mode window is displayed (default mode).

3.) Press **M**-Mode knob on the operator panel to bring up an M-Mode image on the screen.

4.) Use the trackball to position the cursor over the required area of the image.

Figure 4-21 M-mode Screen Example



4-4-7-2 Checks

These Image Controls are used to optimize the M mode image. Verify that all the listed controls are working as intended:

- Check Horizontal sweep to optimize the display resolution.
- Check Gain and TGC controls to adjust the range to be imaged.
- Use the Frequency (move to higher frequencies) or the Frame rate control (move to lower frame rate) to increase resolution in image.
- Use the Frequency (move to lower frequency) to increase penetration.
- Check Focus to move the focal point(s) around the region of interest in the M-Mode display.
- Check Dynamic range to optimize the useful range of incoming echoes to the available grey scale.
- Check Compress and Edge Enhance to further optimize the display.
- Check Reject to reduce noise while taking care not to eliminate significant low-level diagnostic information.

4-4-8 Color Flow Mode Checks

4-4-8-1 Introduction

For information on the system's different modes as well as expected results, the Basic User Manual or User Guide will familiarize you with image optimization for **B-Mode**, **M-Mode**, **Color Flow**, and **Doppler**.

For complete information, refer to the latest revision of the Basic User Manual, Chapter 5.

4-4-8-2 Preparations

Use a phantom (optional) when doing these tests.

1.) Connect one of the probes, to the scanner's active probe connector.
   - see: 3-6-4 "Connecting Probes" on page 3-15 for info about connecting the probes.
   - For available probes, see: Section 9-13 "Probes" on page 9-59.

2.) Turn ON the scanner. The B-Mode window is displayed (default mode).

4-4-8-3 Select Color B-Mode

1.) After optimizing the B-Mode image, then press **CF** (Color Flow).

2.) Move the color flow area of interest as close to the center of the image as possible. To adjust the ROI size, press the top trackball key to select **Size**. To adjust the ROI position, press the top trackball key to select **Pos**.

3.) Optimize the color flow parameters so that a high frame rate can be achieved and appropriate flow velocities are visualized.

Figure 4-22 CF-mode Screen Example

4-4-8-4 Select Color M-Mode

To activate M Color Flow Mode, press **M** (M-Mode). Then press **CF** (Color Flow) - or - press **CF**, then press **M**. **CM** tab is displayed.

Figure 4-23 MCF-mode Screen Example

4-4-8-5 Checks

- Adjust the **Gain** to set the gain in the color flow area.
- Adjust **Scale** to the highest setting that provides adequate flow detection.

NOTE: The scale value may affect Power Output, frame rate, and wall filter.

- Adjust **Wall Filter** to remove low velocity blood flow and motion artifacts that reduces image quality.
- Adjust **Sample volume** (SV) to a low setting for better flow resolution, or a higher setting to more easily locate disturbed flows
- Adjust **Frequency** to optimize the color flow display. Higher settings improve resolution. Lower settings improve depth penetration and sensitivity. This does not affect the frequency used for B and M-Mode.
- • Adjust Acoustic output power to obtain an acceptable image using the lowest setting possible.

NOTE: The Power setting affects all other operating modes.

Adjust the following settings to further optimize display of the image:

- Use **Invert** to reverse the color assignments in the color flow area of the display.
- Use **Threshold** to emphasize either the color flow overlay, or the underlying grey scale tissue detail.
- Use **Baseline** to emphasize flow either toward or away from the probe.

4-4-9 PW/CW Doppler Mode Checks

For information on the system's different modes, the Basic User Manual or User Guide will familiarize you with image optimization for **B-Mode**, **M-Mode**, **Color Flow**, and **Doppler**.

Doppler is used to measure velocity (most often in blood). Doppler mode can be done with a special pencil probe or with an ordinary probe. By using an ordinary probe, you can first bring up a B-Mode picture for navigation purpose and then add Doppler.

For information, refer to the latest revision of the Basic User Manual, Chapter 5.

4-4-9-1 Preparations

1.) Connect one of the probes to the scanner.
   - See: 3-6-4 "Connecting Probes" on page 3-15 for info about connecting the probes.
   - For available probes, see: *Section 9-13 "Probes" on page 9-59.*

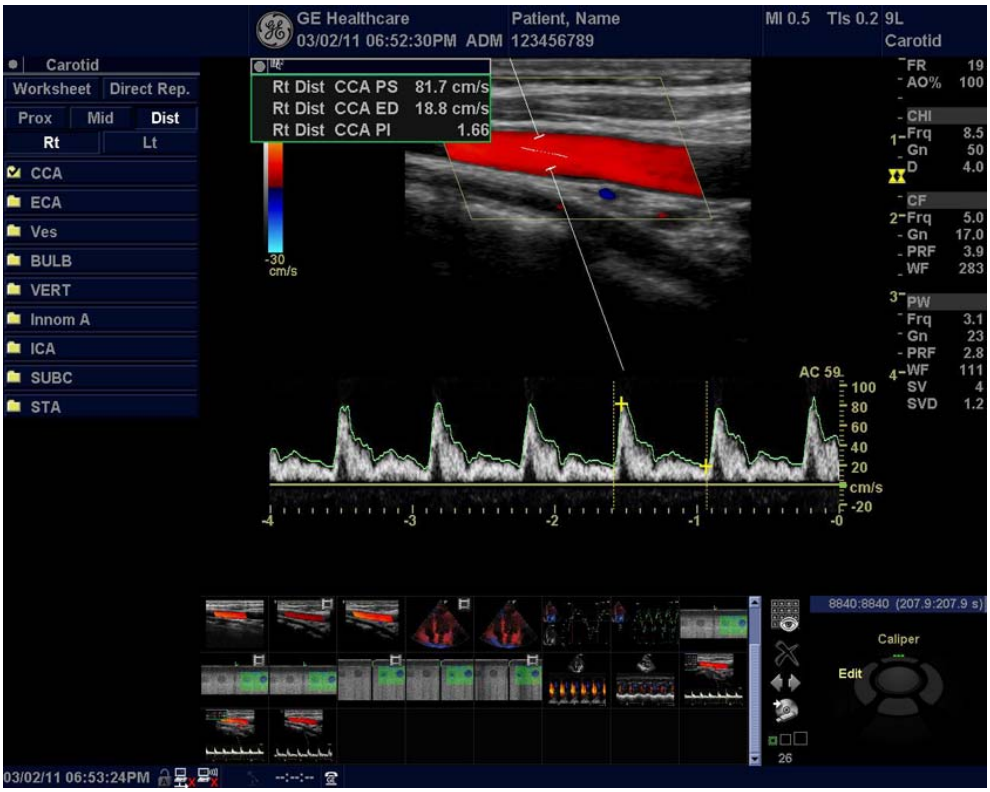
2.) Turn ON the scanner The B-Mode window is displayed (default mode).

3.) If needed, adjust the Display's Brightness and Contrast setting.

4.) Press **PW** or **CW** to start Pulsed Wave Doppler (PW) or Continuous Wave Doppler (CW).

5.) Use the trackball to select the Area of Interest (Sample Volume) in PW or direction of interest in CW.

Figure 4-24 PW-mode Screen Example



4-4-9-2 Adjust the PW/CW Doppler Mode controls

- Adjust the **Gain** to set the gain in the spectral Doppler area.
- Adjust **Wall Filter** to reduce unwanted low velocity blood flow and tissue movement.
- In PW mode, adjust **Sample volume** to low setting for better resolution, or higher setting to more easily locate the disturbed flows.
- Adjust the **Compression** setting to balance the effect of stronger and weaker echoes and obtain the desired intensity display.
- Adjust **Frequency** to optimize flow display. Higher setting will improve resolution and the lower setting will increase the depth penetration.
- Adjust **Frame rate** to a higher setting to improve motion detection, or to a lower setting to improve resolution.
- Adjust **Power** to obtain an acceptable image using the lowest setting possible. This is particularly important in CW mode, as the energy duty cycle is 100% (constant).

NOTE: The Doppler Power setting affects only Doppler operating modes.

Adjust the following settings to further optimize the display of the image.

- Use the **Horizontal sweep** to optimize the sweep speed.
- To view signal detail, adjust **Scale** to enlarge the vertical spectral Doppler trace.
- Use **Invert** to reverse the vertical component of the spectral Doppler area of the display.
- Use **Angle correction** to steer the ultrasound beam to the blood flow to be measured.

4-4-10 Tissue Velocity Imaging (TVI) Checks

4-4-10-1 Introduction

TVI calculates and color codes the velocities in tissue. The tissue velocity information is acquired by sampling of tissue Doppler velocity values at discrete points. The information is stored in a combined format with grey scale imaging during one or several cardiac cycles with high temporal resolution.

4-4-10-2 Preparations

1.) Connect one of the probes, to the scanner's left-most probe connector.
   - See: 3-6-4 "Connecting Probes" on page 3-15 for info about connecting the probes.
   - For available probes, see: *Section 9-13 "Probes" on page 9-59.*

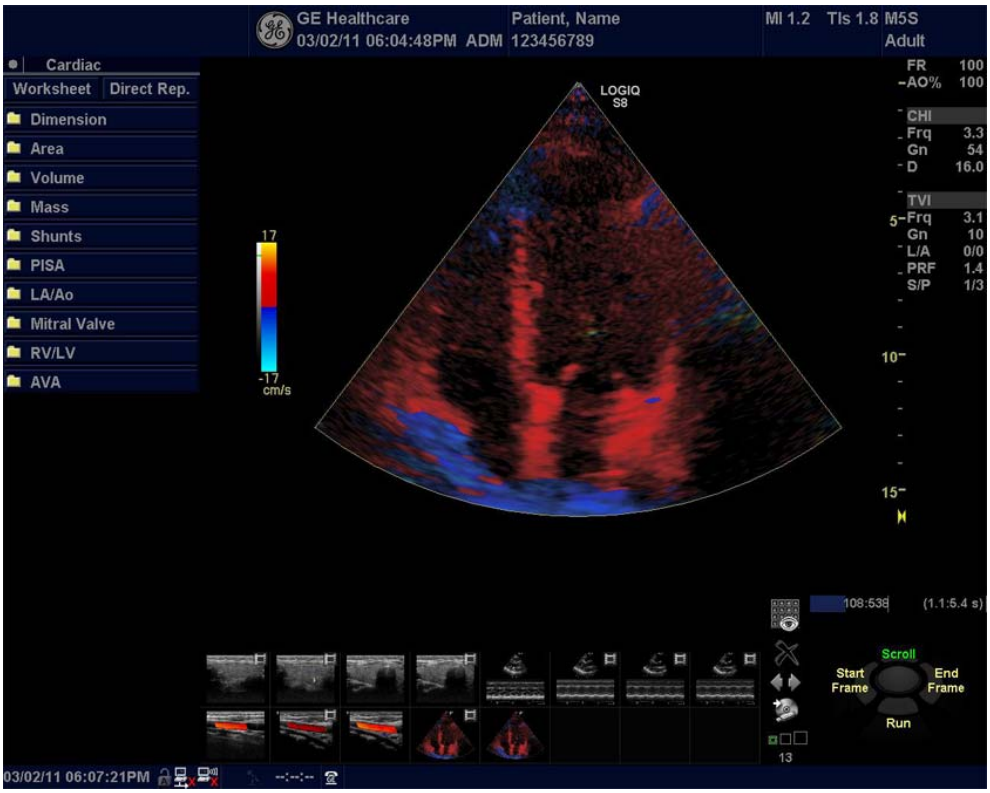
2.) Turn ON the scanner. The B-Mode window is displayed (default mode).

3.) If needed, adjust the Display's Brightness and Contrast setting.

4.) Press **TVI**.

5.) To adjust the ROI size, press the top trackball key to select **Size**. To adjust the ROI position, press the top trackball key to select **Pos**.

Figure 4-25 TVI-mode Screen Example



*NOTE: If the trackball control pointer is selected, press **trackball** key to be able to select between Position and Size controls.*

4-4-10-3 Adjust the TVI Controls

- To reduce quantification noise (variance), the Nyquist limit should be as low as possible, without creating aliasing. To reduce the Nyquist limit: Reduce the **Scale** value.

NOTE: The Scale value also affects the frame rate. There is a trade off between the frame rate and quantification noise.

- TVI provides velocity information only in the beam direction. The apical view typically provides the best window since the beams are then approximately aligned to the longitudinal direction of the myocardium (except near the apex). To obtain radial or circumferential tissue velocities, a parasternal view must be used. However, from this window the beam cannot be aligned to the muscle for all the parts of the ventricle.

NOTE: PW will be optimized for Tissue Velocities when activated from inside TVI.

4-4-11 SWE (Shear Wave "Shear Elasto") Functional Check

- Select a probe (9L D and C1-6D).
- Select ELASTO button.
- In the Touch Panel, select Shear Wave button if not already selected.
- Verify that the Shear Wave button is available.

4-4-12 Cineloop Check

4-4-12-1 Introduction

A cineloop is a sequence of images recorded over a certain time frame. When using ECG the time frame can be adjusted to cover one or more heart cycles. When frozen, the System automatically displays the cineloop boundary markers on either side of the last detected heart cycle.

4-4-12-2 Preparation

1.) Connect one of the probes, to the scanner's active probe connector.
   - see: 3-6-4 "Connecting Probes" on page 3-15 for info about connecting the probes.
   - For available probes, see: Section 9-13 "Probes" on page 9-59.

2.) Turn ON the scanner. The B-Mode window is displayed (default mode).

4-4-12-3 Checks

1.) Press **Freeze**.
2.) Rotate the **Trackball** to scroll through the acquisition and find the sequence of interest.
3.) Select ***Run/Stop*** to playback the loop.
4.) Select ***Run/Stop*** again to stop the CINE Loop.
5.) Adjust **Cycle select** to move from heart beat to heart beat and select the heart cycle of interest.
6.) Adjust **Num cycles** to increase or decrease the number of heart beats to be played back.

4-4-13 Basic Measurements

NOTE: The following instructions assume that you first scan the patient and then press Freeze.

4-4-13-1 Check Distance and Tissue Depth Measurement

1.) Press **Measure** once to display an active caliper.
2.) Move the Trackball to position the active caliper at the start point (distance) or the most anterior point (tissue depth).
3.) Press **Set** to fix the start point.
4.) The system fixes the first caliper and displays a second active caliper.
5.) Move the Trackball to position the second active caliper at the end point (distance) or the most posterior point (tissue depth).
6.) Press **Set** to complete the measurement. The system displays the distance or tissue depth value in the measurement results window.

NOTE: Before you complete a measurement:

- *To toggle between active calipers, press **Measure**.*
- *To erase the second caliper and the current data measured and start the measurement again, press **Clear** once.*

NOTE: To rotate through and activate previously fixed calipers, turn Cursor Select.

*NOTE: After you complete the measurement, to erase all data that has been measured to this point, but not data entered onto worksheets, press **Clear**.*

4-4-13-2 Check Circumference/Area (Ellipse) Measurement

1.) Press **Measure** once to display an active caliper.
2.) Move the Trackball to position the active caliper.
3.) Press **Set** to fix the start point.
4.) The system fixes the first caliper and displays a second active caliper.
5.) Move the Trackball to position the second caliper.
6.) Turn the Ellipse control; an ellipse with an initial circle shape appears.

*NOTE: Be careful not to press the **Ellipse** control as this activates the Body Pattern.*

7.) Move the Trackball to position the ellipse and to size the measured axes (the calipers).
8.) To increase the size, turn the Ellipse control in a clockwise direction. To decrease the size, turn the Ellipse control in a counterclockwise direction.
9.) To toggle between active calipers, press **Measure**.
10.) Press **Set** to complete the measurement.
11.) The system displays the circumference and area in the measurement results window.

NOTE: Before you complete a measurement:

- *To erase the ellipse and the current data measured, press **Clear** once. The original caliper is displayed to restart the measurement.*
- *To exit the measurement function without completing the measurement, press **Clear** again.*

4-4-13-3 Worksheets

Measurement/Calculation worksheets are available to display and edit measurements and calculations. There are generic worksheets as well as Application specific worksheets. The worksheets are selected from the Measurement Touch Panel.

4-4-13-4 Report Pages

Measurements/Calculations that are included on the worksheet can also be displayed on Report Pages. Report Pages can be customized to meet the appropriate needs of the user.

4-4-14 System Integration Checks

4-4-14-1 Operator panel Test

Figure 4-26 Operator panel

1.) Power ON the system.
2.) Check backlight on AN Keyboard, B Button, Freeze Key and TGC Knob.
3.) Select **UTILITY** in touch panel.
4.) Turn joystick knobs to adjust the backlighting of Touch Panel Light/Keyboard Light/Button Light.
5.) Verify backlight luminance (intensity) changes when knobs are turned.

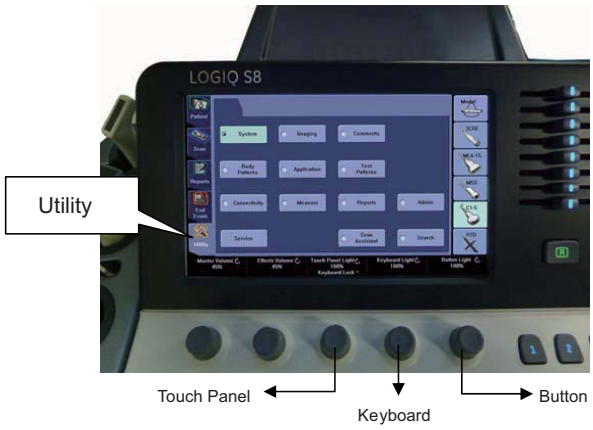


Figure 4-27 Touch panel and knobs

Figure 4-28

6.) Connect any probe. (if not connected)
7.) Go to Live CF Mode. (Press “CF” Mode button, unfreeze.)
8.) Verify both B button and CF button are lit GREEN.
9.) Turn “GAIN” encoder around CF Mode button and verify ROI gain change.
10.) Operate TGC sliders and verify B image gain change.
11.) Press “COMMENT” key.
12.) Type in arbitrary strings from A/N Keyboard. Verify keyboard is functional.

4-4-14-2 DVD Drive Test

1.) Insert Blank CD-R or DVD-R Media into Optical Drive.
2.) Select **UTILITY** -> **SYSTEM** -> **Backup Restore.**
3.) Select “CD/DVD” in “MEDIA” list.
4.) Select “User Define Configuration checkbox” in Backup and Press “Backup”.
5.) Start backup into Media by pressing “OK” Button.
6.) Verify “Finished OK” message appears.

4-4-14-3 LAN Port Test

1.) Plug the Ethernet Cable to connect local area network.
2.) Verify that Local area network connection is recognized.

4-4-15 Probe/Connectors Checks

NOTE: Probes can be connected at any time, whether the unit is ON or OFF.

4-4-15-1 To Connect a Probe

1.) Place the probe's carrying case on a stable surface and open the case.
2.) Carefully remove the probe and unwrap the probe cable.
3.) DO NOT allow the probe head to hang free. Impact to the probe head could result in irreparable damage.
4.) Turn the connector locking handle counterclockwise.
5.) Align the connector with the probe port and carefully push into place.
6.) Turn the connector locking handle clockwise to secure the probe connector.
7.) Carefully position the probe cable in the probe cord holder spot so it is free to move, but not resting on the floor.

CAUTION TAKE THE FOLLOWING PRECAUTIONS WITH THE PROBE CABLES:
- KEEP AWAY FROM THE WHEELS
- DO NOT BEND
- DO NOT CROSS CABLES BETWEEN PROBES

Table 4-2 Probe and Connectors Checks

Step	Task	Expected Result(s)
1.	Select the appropriate connected probe from the probe indicators on the Touch Panel.	The probe activates in the currently-selected operating mode. The probe's default settings for the mode and selected exam are used automatically.
2.	Launch the application. To change application without changing the current probe, press **the desired Mode** on the Operator Panel.	The selected application starts.
3.	Verify no missing channels	All channels is functioning.
4.	Verify there's no EMI/RFI or artifacts specific to the probe.	No EMI/RFI or artifacts.
5.	Test the probe in each active connector slot., see: 3-6-4 "Connecting Probes" on page 3-15	It will display pictorial data each time
6.	Do a leakage test on the probe, see: Section 10-8 "Electrical Safety Tests" on page 10-17	It passes the test.
7.	Repeat this procedure for all available probes.	

4-4-15-2 TEE RS-DLP adapter + TEE probe

1.) Connect TEE RS-DLP adapter + TEE probe. Select cardiac application like “Adult”. And start scan.
2.) Verify calibration normally finished.
3.) Verify that B mode image appear.

4-4-16 ECG Check

4-4-16-1 Introduction

The ECG capability on this unit, is intended as use as a trigger for measurements, but can also be viewed on the screen.

4-4-16-2 Parts needed

- ECG Harness
- ECG Pads, (3 pc)

or

- ECG Simulator

4-4-16-3 Preparations

None

4-4-16-4 ECG Checks

1.) Select **Model** on the touch panel.

2.) Select **Cardiac** as application and select **Scan**.

3.) If you do not see the ECG line, select the **ECG** tab and press **ECG DISPLAY**. You should then see the line.

NOTE: If the ECG tab is not displayed, select Utility ->Application and Check "Show ECG Tab".

NOTE: Without the ECG option, the ECG touch panel is not displayed.

NOTE: For more information about ECG, refer to the latest revision of the LOGIQ™ S8 Basic User Manual, Chapter 13.

Plug in the ECG cables with nothing attached, so you pick up noise, the line should display noise.

Table 4-3 ECG Checks

Step	Task	Expected Result(s)
1.	Connect the ECG harness to the connector on the front of the system	The unit displays a straight curve along the bottom edge of the image sector on the screen.
2.	Connect the three leads to a ECG simulator, or Fasten the three ECG Pads to your body and connect the three leads to respective ECG Pad	When connecting, the signal on the screen will be noisy When the connection is completed, a typical clean ECG signal is displayed.

4-4-17 Peripheral Checks

4-4-17-1 Hardware DVR Test (if equipped on R1.x.x or R2.x.x)

Required: Blank [DVD+RW] media.

1.) Make sure the tab menu of "**Video**" is found on the right-most touch panel tab. If not found, go to "Utility" -> "Application" -> "Setting" and check "Show video Tab".
2.) Insert the media. Go to DVR Touch Panel menu.
3.) For R1 system, press **REC-Standby** to go stand-by.
4.) Start Recording. Perform image scanning including Doppler sound.
5.) Stop Recording.
6.) Exit from stand-by.
7.) Play.
8.) Verify that Recorded image and sound can be played back.

NOTE: For more information about DVR, refer to the latest revision of the Basic User Manual, Chapter 9.

4-4-17-2 Software DVR Test (if equipped on R3.0.0 and later)

Required: Blank [DVD+RW] media.

1.) Make sure the tab menu of "**Video**" is found on the right-most touch panel tab. If not found, go to "Utility" -> "Application" -> "Setting" and check "Show video Tab".
2.) Go to "Utility" -> "System" -> "Peripherals" and confirm "DVD" is set as DVR media. If not, set it and restart the system.
3.) Insert the media. Go to DVR Touch Panel menu.
4.) Start Recording. Perform image scanning including Doppler sound.
5.) Stop Recording.
6.) Play.
7.) Verify that Recorded image and sound can be played back.

NOTE: For more information about DVR, refer to the latest revision of the Basic User Manual, Chapter 9.

4-4-17-3 Black and White Printer Test

1.) Print an image by pressing **P** button associated with BW Printer. (P key should be configured correctly.)
2.) Verify that image can be printed.
3.) Verify that printed image has no distortion as compared the image on screen.

4-4-17-4 Color Printer Test

1.) Print an image by pressing **P** button associated with Color Printer. (P key should be configured correctly.)
2.) Verify that image can be printed.
3.) Verify that printed image has no distortion as compared the image on screen.

4-4-17-5 CD/DVD Read/Write Test

1.) Insert Blank CD/DVD Media into Optical Drive.
2.) Go to Utility -> System -> Backup Restore. Select "CD/DVD" in "Media" list.
3.) Select "User Define Configuration checkbox" in Backup and press **Backup**.
4.) Start backup into Media by pressing **OK** Button.
5.) Verify that "Finished OK" message appears.

4-4-17-6 Gel Warmer Test

1.) Insert Gel Bottle into Gel Warmer.

2.) Power ON the warmer.

Figure 4-29 Gel warmer ON/OFF switch

3.) Verify Gel gets warm.

NOTE: Depending on environment, Gel requires 30 minute or more to warm up.

4-4-17-7 Single CWD

1.) Connect P2D or P6D probe. Select cardiac application like “Adult”. And start scan.

2.) Verify that CW timeline image appears.

4-4-18 System Exterior Visual Check

4-4-18-1 Physical Abnormalities

Check for no loose or cracked parts on above locations.

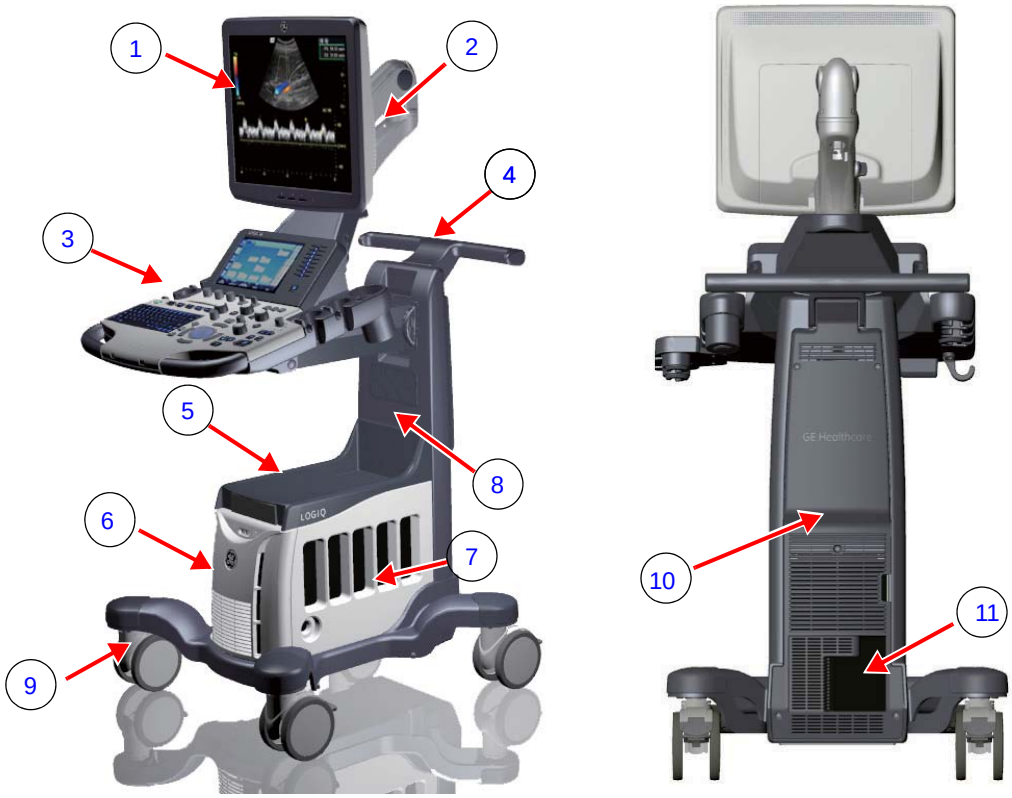


Figure 4-30 LOGIQ S8 System Exterior (example)

No.	Parts name
1	Main monitor
2	Monitor Arm
3	Control Panel
4	Rear Handle
5	Top Cover
6	Front Cover
7	Side Covers
8	Base
9	Casters
10	Rear Cover
11	External I/O Panel - AC Power Plug Holder

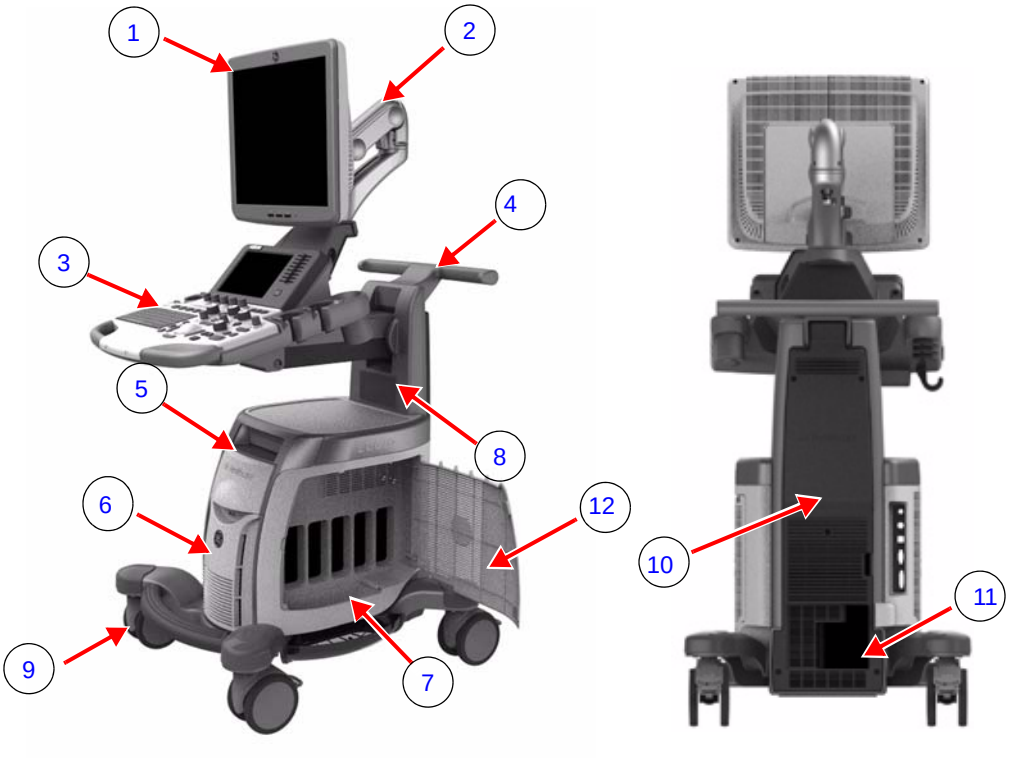


Figure 4-31 LOGIQ E8 System Exterior

No.	Parts name
1	Main Monitor
2	Monitor Arm
3	Control Panel
4	Rear Handle
5	Top Cover
6	Front Cover
7	Side Covers
8	Base
9	Casters
10	Rear Cover
11	External I/O Panel - AC Power Plug Holder
12	Probe door

4-4-18-2 Label Check

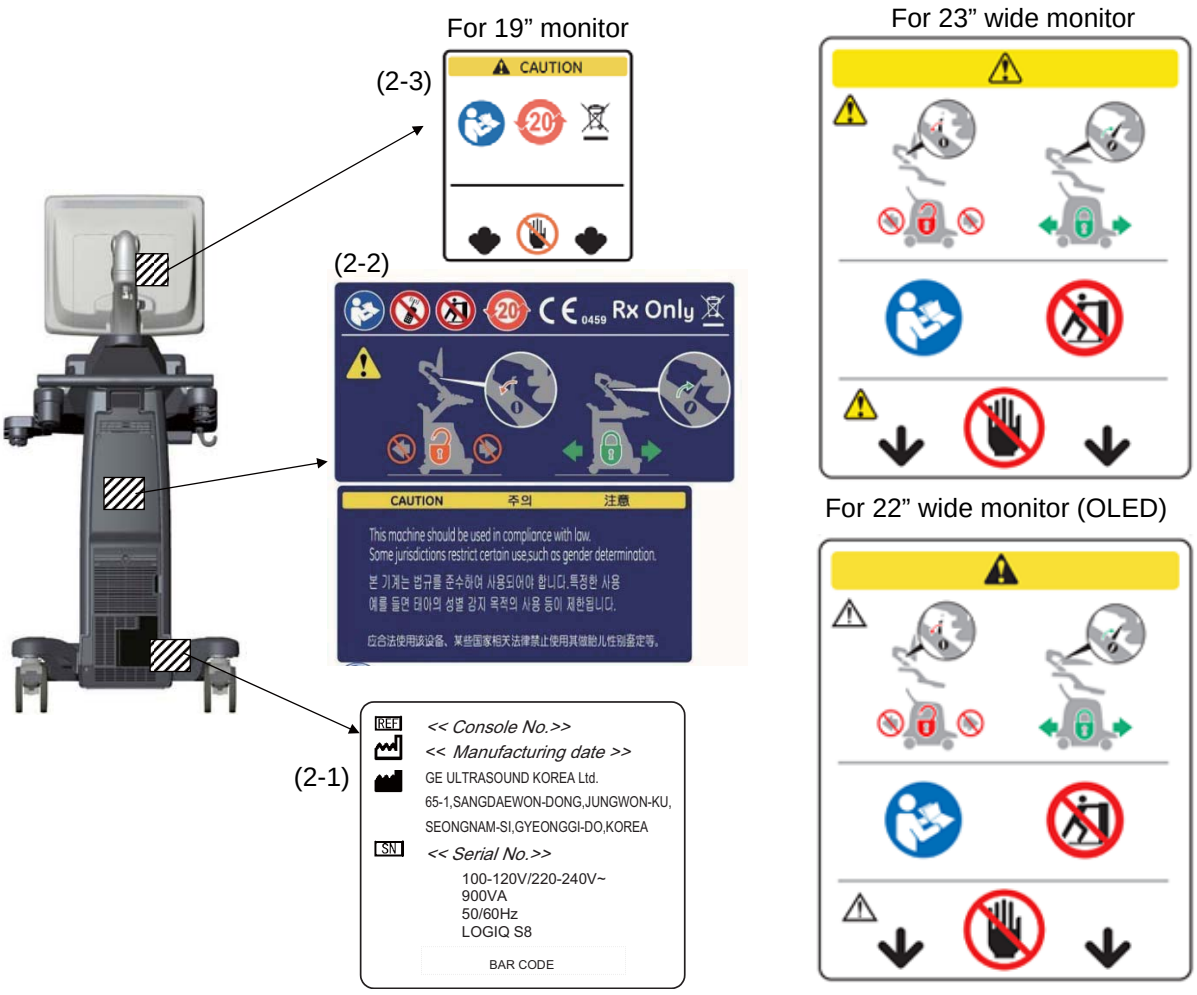


Figure 4-32 Label location (R1 - R3 system)

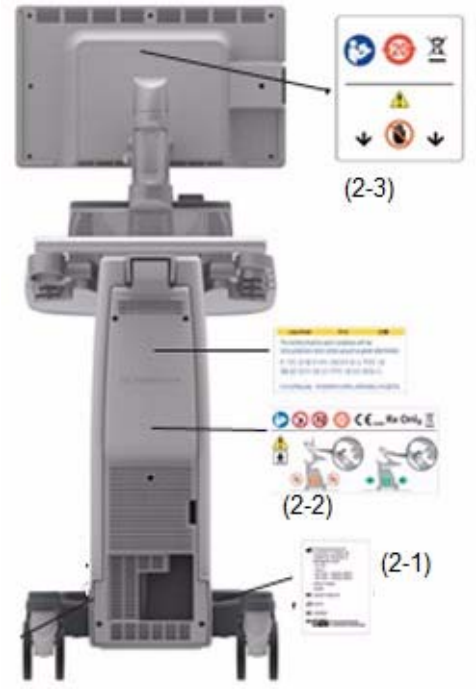


Figure 4-33 Label location (R4 system)

1.) Check presence of Caution Label on the rear panel of the monitor (2-3).
2.) Check presence of Multi Caution Label (2-2).
3.) Check presence of Rating Plate (2-1).

NOTE: Rating Plate design slightly differ depending on Console destination. At minimum simply check Console number, manufacturing date and serial Number.

NOTE: Some countries may not have "gender determination" label.

4-4-18-3 Appearance Inspection

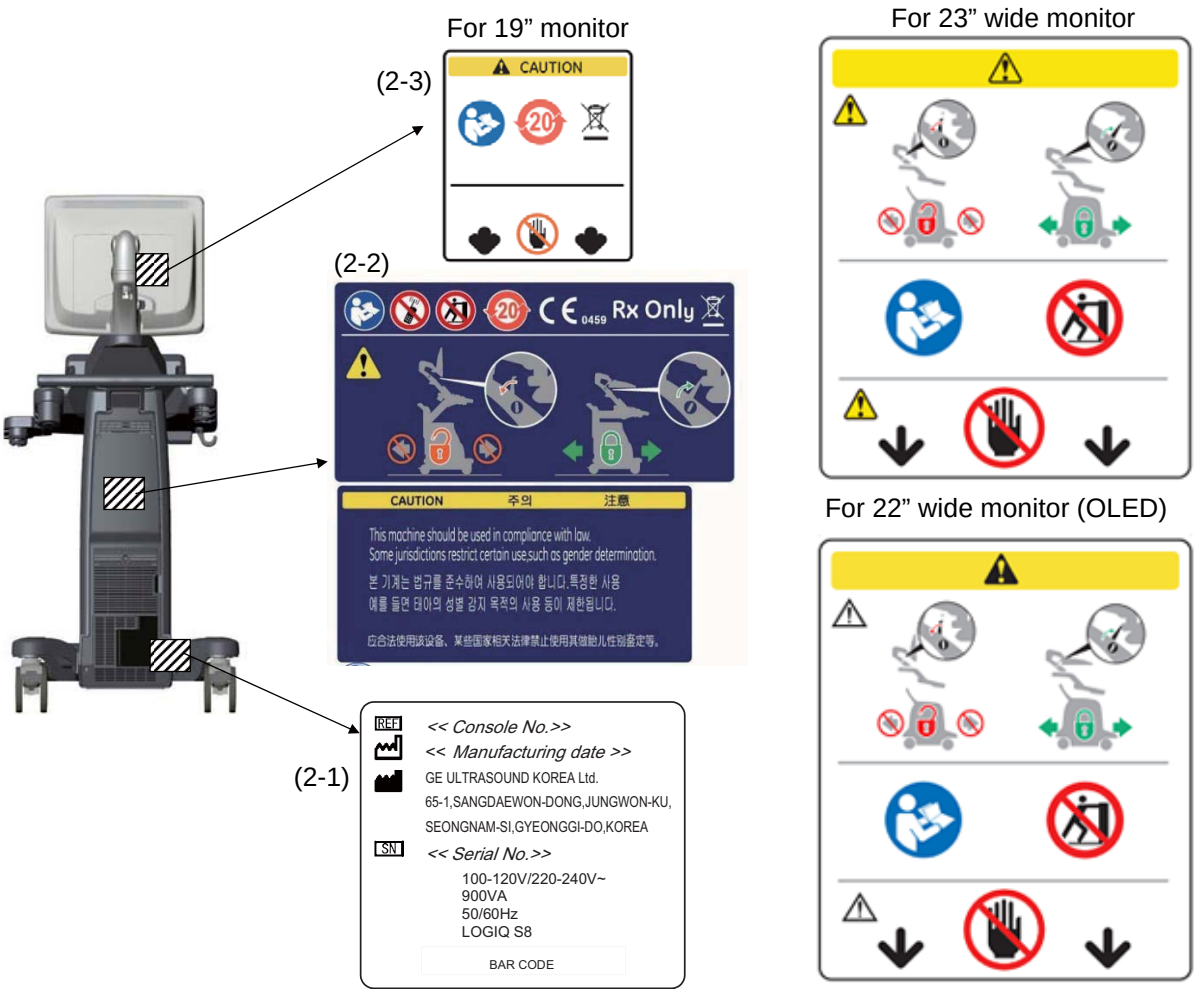


Figure 4-34 Product Labels

1.) Check presence of Caution Label on the rear panel of the monitor (2-3).
2.) Check presence of Multi Caution Label (2-2).
3.) Check presence of Rating Plate (2-1).

NOTE: Rating Plate design slightly differ depending on Console destination. At minimum simply check Console number, manufacturing date and serial Number.

NOTE: Some countries may not have “gender determination” label.

4-4-19 Mechanical Functions Checks

4-4-19-1 Monitor and Control panel movement

Refer to

- 4-3-5 "Monitor Positions Adjustment" on page 4-7
- 4-3-6 "Operator panel position adjustment" on page 4-9

4-4-19-2 Caster checks

Refer to

- 4-3-7 "Caster" on page 4-11

4-4-20 Extended Battery (Option)

NOTE: This test is only applied if the Battery option has been installed.

Perform Diagnostics.

1.) Select “UTILITY” -> “Service”.
2.) From ‘DIAGNOSTICS’, select “Service Diagnostics for Pyxis”.
3.) Select Battery Test.
4.) Verify test results shows PASS.

NOTE: In case of Extended Battery, Diag can be performed with “over 15%” charging condition. And actual battery kit is shipped with “20~30%” charged condition, so basically you don’t need to check capacity for function-test of extended battery. If capacity is less than 15%(normally this case is not happen), you have to wait to charge, it takes around 5 minutes to increase 1%.

4-4-21 3D/4D (Option)

NOTE: This test is only applied if the 4D options (both hardware and software) have been installed.

1.) Prepare a 4D probe that the version of software has supported. Make sure that the probe is connected properly.
2.) Select the probe on the touch panel.
3.) Press 3D/4D key.
4.) Press Static 3D.
5.) Press Start Set key.
6.) Verify that Static 3D image is acquired.

4-4-22 Volume Navigation (Option)

Refer to Section 6-3 "Volume Navigation Calibration Procedure" on page 6-10 for Volume Navigation Functional Check.

4-4-23 FibroScan module (Option)

NOTE: This test is only applied if the FibroScan option has been installed

Perform following tests. Make sure cables are well connected between system and FibroScan Module.

1.) Boot up and wait until the system show scan screen.

2.) Check the 3 LED (green, blue and white) on FibroScan Module front panel are lit.

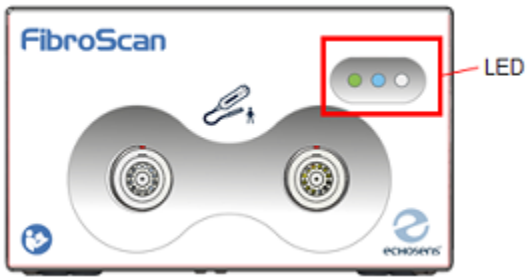


Figure 4-35 LED on FIbroScan

3.) Select the assigned key to start FibroScan mode - Screen will be dual screen, FibroScan view will be showed on right side of monitor, and Touch panel will be FibroScan tab.

4.) Connect either M+ or XL+ probe to FibroScan Module.

5.) Select the exam type button to activate the connected probe - The activated probe blue LED will start blinking.

6.) Apply pressure to probe with you finger tips.

7.) Check on the FibroScan view that probe pressure indicator, A mode and M mode of FibroScan view is showed.

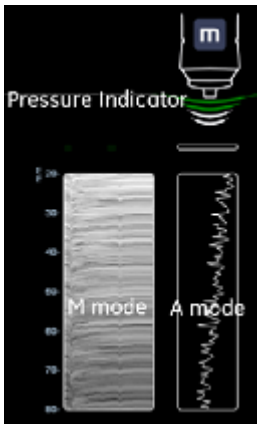


Figure 4-36 A mode and M Mode of FibroScan

Section 4-5
Application Turnover Check List

Complete these checks before returning the scanner to the customer for use:

4-5-1 Software Configuration Checks

Table 4-4 Software Configuration Checks

STEP	TASK	CHECK (✓)		
1.	Check Date and Time setting			
2.	Check that Location (Hospital Name & Department) is correct			
3.	Check Language settings			
4.	Check assignment of Printer Keys	P1	P2	P3
5.	Check that all of the customer's options are correctly installed			

Section 4-6
Power supply test and adjustments

4-6-1 Power Supply Test Procedure

Run the System Voltage test. Refer to 7-9-3 "System" on page 7-130.

4-6-2 Power Supply Adjustment

There are no adjustments on the power supplies. The DC Power is self-regulated. If a voltage is outside the specified range, it means that something is wrong, either with the power supply itself or with a unit connected to that specific power outlet.

Section 4-7
Site Log

Table 4-5 Site Log

DATE	SERVICE PERSON	PROBLEM	COMMENTS

Table 4-5 Site Log (Continued)

DATE	SERVICE PERSON	PROBLEM	COMMENTS

Chapter 5
Components and Functions (Theory)

Section 5-1
Overview

5-1-1 Purpose of this chapter

This chapter explains LOGIQ S8's system concepts, component arrangement, and subsystem function. It also describes the Power Distribution scheme and probes.

NOTE: When not otherwise specified, the contents of this manual and reference to LOGIQ S8 applies to all LOGIQ S8/LOGIQ E8/LOGIQ S8 Vet models.

5-1-2 Contents in this chapter

Section 5-2
General Information

LOGIQ S8 is a digital beam forming curved-, linear- and phased array ultrasound imaging system. The system supports various operating mode such as

- B-Mode, M-Mode, Color Flow (CFM)
- Power Doppler Imaging (PDI), PW Doppler, CW Doppler
- Volume Mode (3D/4D)

Refer to Basic User Manual for full range of operating mode.

5-2-1 System Exterior

5-2-1-1 R1, R2 and R3

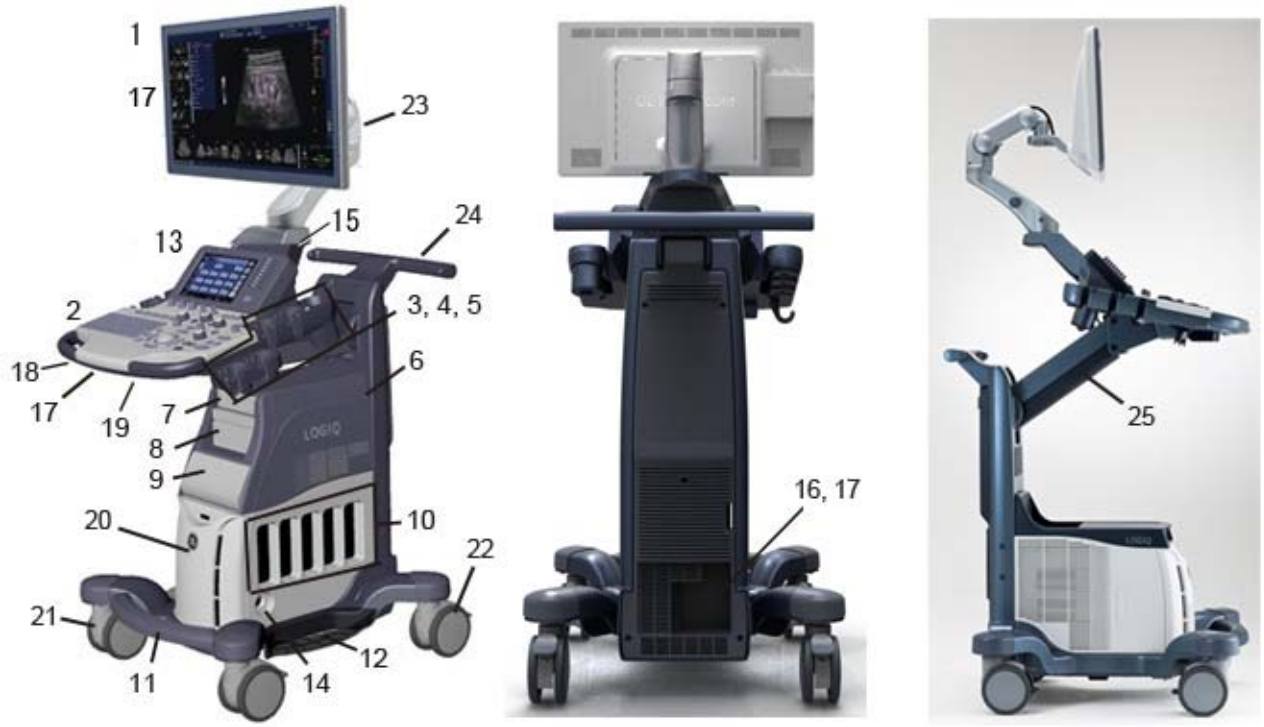


Figure 5-1 System Exterior (High cabinet type example)

1.) Monitor
2.) Control panel
3.) Probe holder
4.) Optional probe holder
5.) Gel warmer
6.) Audio speaker
7.) DVD Drive
8.) B/W Printer or V-Nav
9.) Color printer or Drawer
10.) Probe port - 4 active probe port and 1 parking port (LE8 has the cover)
11.) Foot rest
12.) Side tray (option)
13.) Touch panel
14.) CW pencil probe port
15.) ECG Connector
16.) External I/O panel
17.) USB ports (left side of 23” monitor, right side of OLED monitor)
18.) Control panel swivel lever
19.) Control panel up/down lever
20.) Cooling fan and dust filter (inside front cover)
21.) Caster
22.) Swivel lock caster
23.) Articulating monitor arm with lock
24.) Handle
25.) Operator panel elevation arm

5-2-1-2 R4 and later

Figure 5-2 LOGIQ S8 R4 and later System (Mid cabinet type example)

1.) Wide Monitor
2.) Control panel
3.) Probe holder
4.) Gel warmer
5.) Audio speaker
6.) DVD Drive
7.) Blind cover, B/W printer, Color Printer. Drawer, V-Nav controller or FibroScan module
8.) Probe port - 4 active probe ports, 1 parking port.
9.) CW pencil probe port
10.) Footrest
11.) Measurement Selection Menu
12.) ECG connector
13.) External I/O panel
14.) USB port
15.) Control panel swivel lever
16.) Control panel up/down lever

5-2-1-3 Operator Panel

Figure 5-3 R1 - R3 Operator Panel

Figure 5-4 R4 and later Operator Panel

5-2-1-4 Probe connector

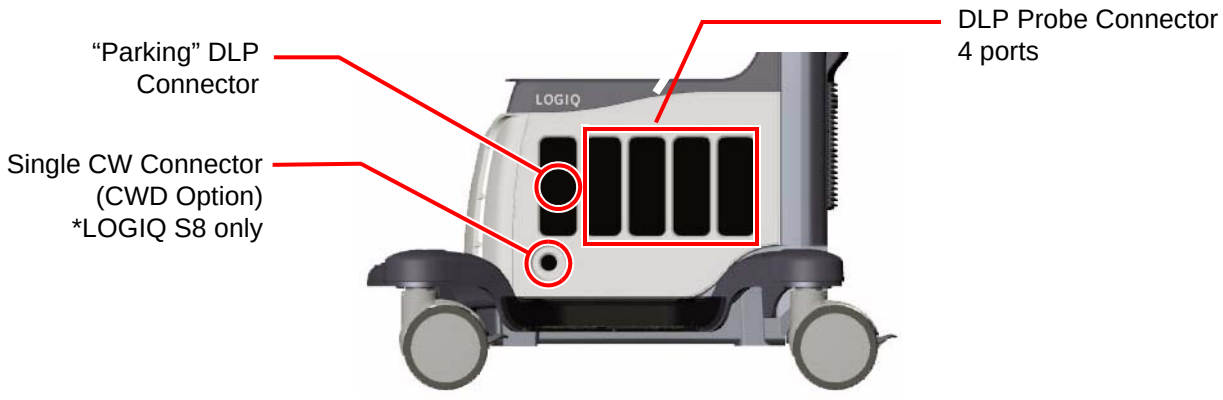


Figure 5-5 Probe connector

5-2-2 System Options

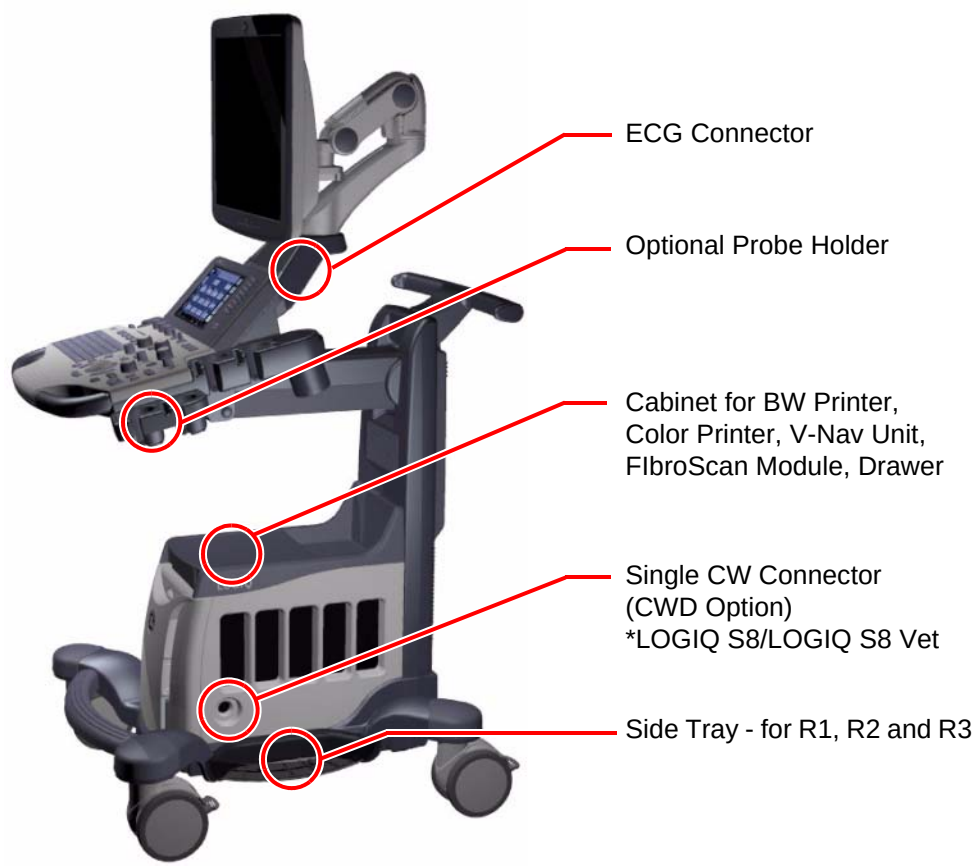


Figure 5-6 System Options

5-2-3 USB Ports

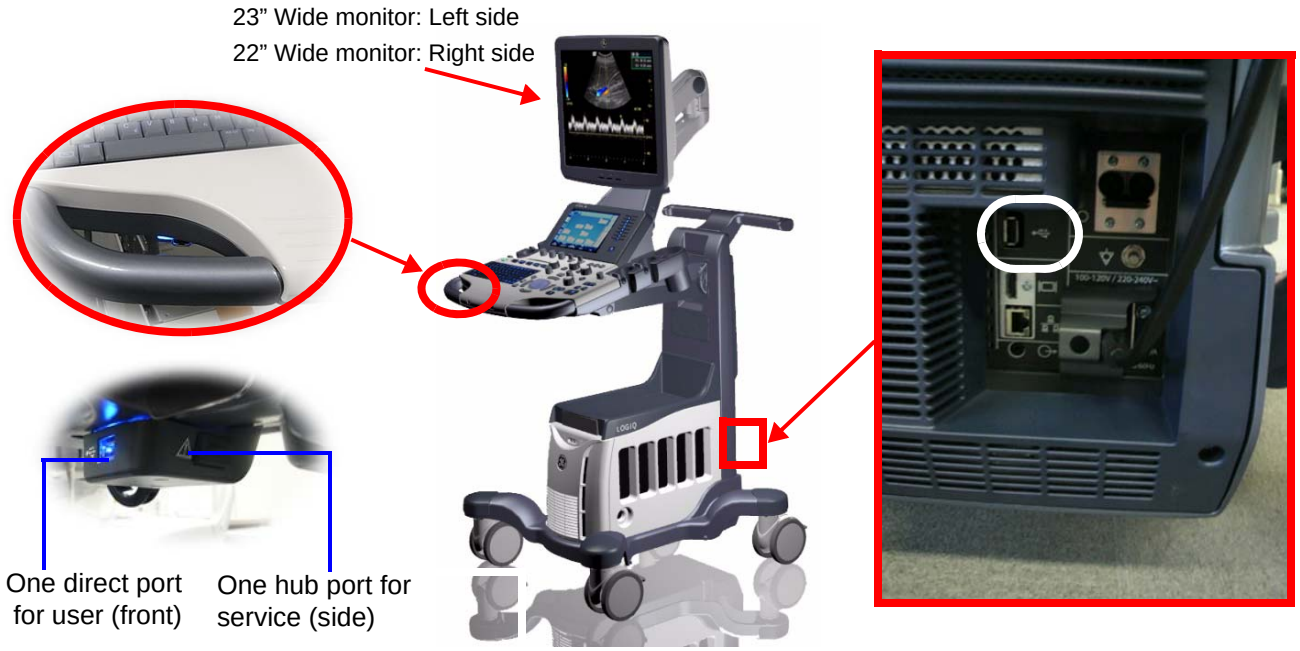


Figure 5-7 USB Ports on the system

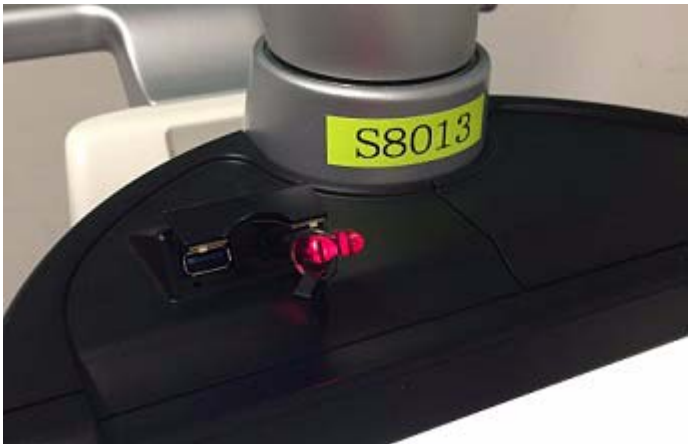


Figure 5-8 OPIO USB port - R4 system

5-2-3-1 Front USB - For R1, R2 and R3

Two USB ports are located beneath the operator panel.

Table 5-1 Front USB port

Location	Description
Front side	USB 2.0, 480 Mbps, 5V 500 mA The customer use connected to USB controller direct for USB storage (USB-HDD and USB Flash Device).
Right side	USB 2.0, 480 Mbps, 5V 500 mA Service port connected to USB Controller via USB Hub. This port is capped with rubber cover.

NOTE: Front USB ports are non-isolated and not fit to connect external powered USB Devices.

5-2-3-2 Rear USB

Table 5-2 Type of Rear USB port

Software version	Description
R1/R2	USB 1.1, 12 Mbps, 5V 500 mA, isolated. Only Full speed (12Mbps) is supported. Low speed(1.5Mbps) does not work.
R3 and later	USB2.0, 480 Mbps, 5V 500 mA, non-isolated. *NOTE: Connector type is USB3.0, but it works as USB2.0.*

- Foot switch
- PC printer
- A5 printer
- Card reader
- USB Storage (USB-HDD and USB Flash device)

NOTE: R1/R2 console: A USB device with the external power source (non-bus-powered) device should only be connected to isolated rear USB port.

NOTE: R3 console: Use a USB isolator when connect the external power source (non-bus-powered) device to the LOGIQ S8.

NOTE: Maximum allowable current through a USB port is 500 mA. Devices connected to a port should not consume more than rated limit

5-2-3-3 USB ports on the monitor (R3 and later)

The two USB2.0 Ports are used for USB Storage (USB-HDD and USB Flash Device).

NOTE: USB ports on the monitor are non-isolated and not fit to connect external powered USB Devices.

NOTE: Connector type is USB3.0, but it works as USB2.0.

Table 5-3 Specification

Software version	Description
R3 or later	USB 2.0, 480 Mbps, 5V 500 mA

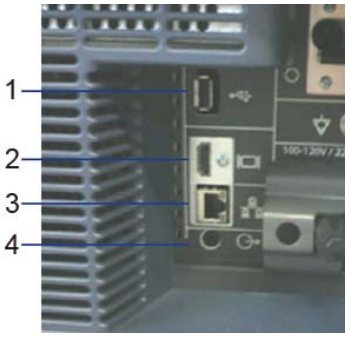
5-2-3-4 USB ports on the OPIO (R4 or later)

The two USB3.0 Ports are used for USB Storage (USB-HDD and USB Flash Device)

Table 5-4 Specification

Software version	Description
R4	USB 3.0, 5 Gbps, 5V 900 mA

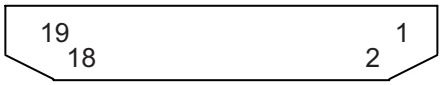
5-2-4 Rear panel



1.) USB Port: USB2.0 Full Speed (R3 and later: No isolated)
2.) HDMI connector: HDMI connector for an external monitor
3.) Ethernet: LAN for InSite Connection (RJ45)
4.) Audio: Audio line out (3.5mm pin jack)
5.) Circuit breaker: 10A
6.) AC Inlet: 100-120V/220-240V

5-2-4-1 HDMI

NOTE: External display I/O is DVI-D. However, connector shape is HDMI connector.



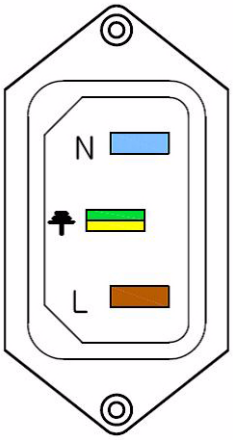
5-2-4-2 Ethernet

1000 Base-T, 100 Base-T, 10 Base-T

5-2-4-3 Audio MiniJack

Normal Audio L/R GND pin assign Line out

5-2-4-4 AC Inlet



100-120V/220-240V AC

Figure 5-9 AC Inlet

Section 5-3
Power Distribution

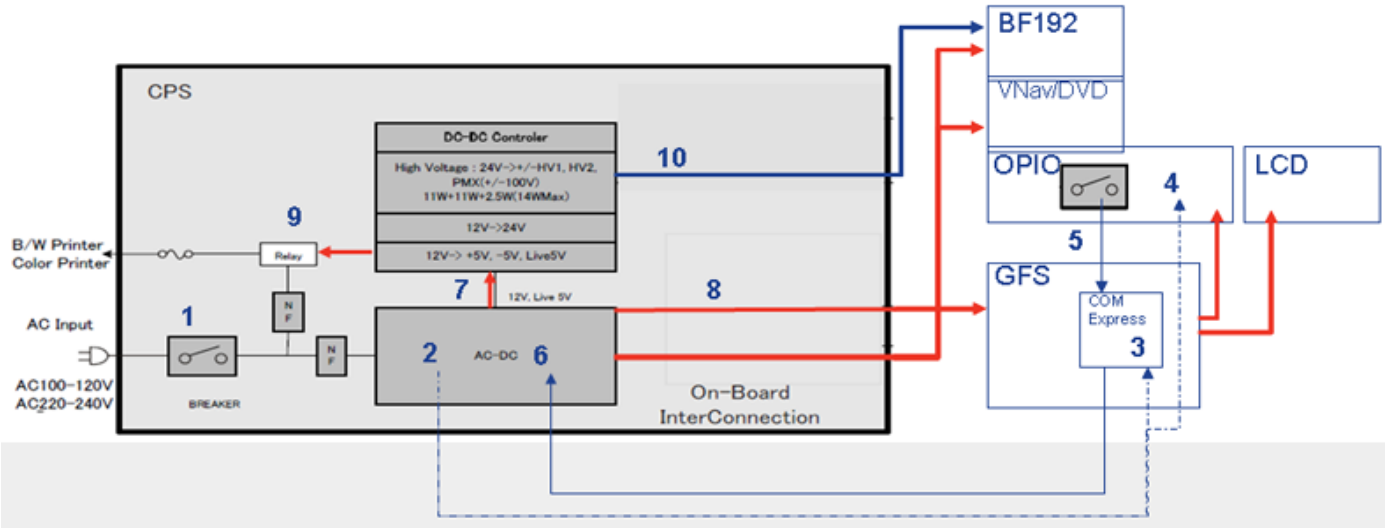
5-3-1 Purpose of this section

The power distribution within the LOGIQ S8 is described in this section.

5-3-2 Power Up Sequence Description

The Power Up Sequence can be divided in the following steps:

1.) Connect the mains power to the LOGIQ S8 and switch Circuit Breaker to ON position.
2.) Press the Power ON button on the Operator Panel.
3.) BEP (and system) power-up.



Sequence

1.) Circuit breaker ON
2.) AC/DC Unit creates Stand-by Power
3.) Stby Power routed to COM Express
4.) Stby Power routed to OPIO (LED)
5.) Main ON signal from OPIO
6.) COM Express Sends ON Signal to AC/DC
7.) AC/DC route 12V to DC-DC Controller
8.) AC/DC route 12V to system
    - GFS, BF192, and VNav/DVD/FibroScan module
    - GFS powers OPIO and LCD
9.) Main AC power routed to Peripherals (Printers)
10.) DC-DC sends HV to BF192

NOTICE For LOGIQ S8/LOGIQ E8 system, Power-ON using Battery is NOT allowed.

NOTICE From R4 system, AC/DC automatically turns on to charge battery on Stand-by state (Sequence 2 above).

Section 5-4
Power Loss description

A power loss may be due to:

- The Mains Switch has been switched to OFF
- The Mains cable has been disconnected
- Brown-out

If a power loss occur, all AC power distribution within the unit is lost. Both the Back End Processor and the Front End Card Rack stops functioning, the peripherals and the monitor also looses its power.

Section 5-5
Software Overview

5-5-1 Purpose of this section

LOGIQ S8 has a huge amount of features implemented in software. The intention with this section is to give you a brief overview of the software used on LOGIQ S8. You can also refer to the Basic User Manual for more information

5-5-2 Contents in this section

5-5-3 LOGIQ S8 software

- **LOGIQ S8 running R1.x software:**
  - The LOGIQ S8 Software is based on Windows XP Embedded.
- **LOGIQ S8 running R2 to R4 software:**
  - The LOGIQ S8 Software is based on Windows 7 Embedded.
- **LOGIQ S8 running R4.2.5x and later software:**
  - The LOGIQ S8 Software is based on Windows 10 Embedded.

Section 5-6
Software Options

NOTE: Elastography Quantification is not available in the United States of America.

NOTE: For TUI, VOCAL II, VCI Static, STIC and OmniView, "H46352LJ - 4D Option Kit" is required.

NOTE: Not all features or products described in this document may be available or cleared for sale in all markets.

Table 5-5 Software Option list

Software Options	Description	Install available or not				
		R1	R2	R3	R4	R4.2.5x
Advanced 3D	Designed for rendering B Mode and Color Flow Mode images, e.g., vessel trees. This is a standard feature from R2 and onward	Yes	STD	STD	STD	STD
Auto IMT	Automatically measures the thickness of the Intima Media on the far and near vessel walls. Near Wall IMT is the distance between the trailing edges of the adventitia and intima; the Far Wall IMT is the distance between the leading edges of the adventitia and intima.	Yes	Yes	Yes	Yes	Yes
B-Flow	Intended to provide a more intuitive representation of non-quantitative hemodynamics in vascular structures. All B-Mode measurements are available with B-Flow active: depth, distance along a straight line, % stenosis, volume, trace, circumference, and enclosed area.	Yes	Yes	Yes	Yes	Yes
Coded Contrast	Provides contrast imaging capability	Yes	Yes	Yes	Yes	Yes
CW Doppler (LS8 only)	Allows examination of blood flow data all along the Doppler Mode cursor rather than from any specific depth. Gather samples along the entire Doppler beam for rapid scanning of the heart. Range gated CW allows information to be gathered at higher velocities.	Yes	Yes	Yes	Yes	Yes
DICOM	To enable DICOM connection to network devices.	Yes	Yes	Yes	Yes	Yes
Elastography	Elastography shows the spatial distribution of tissue elasticity properties in a region of interest by estimating the strain before and after tissue distortion caused by external or internal forces. The strain estimation is filtered and scaled to provide a smooth presentation when displayed.	Yes	Yes	Yes	Yes	Yes
Elasto Quantification	Provides QAnalysis function in Elastography	Yes	Yes	Yes	Yes	Yes
Flow Quantification	Provides QAnalysis function in Flow	Yes	Yes	Yes	Yes	Yes
LOGIQView	Provides the ability to construct and view a static B-Mode image which is wider than the field of view of a given transducer. This feature allows viewing and measurements of anatomy that is larger than what would fit in a single image. Examples include scanning of vascular structures and connective tissues in the arms and legs.	Yes	Yes	Yes	Yes	Yes
Report Writer	Provides output to external printers	Yes	Yes	Yes	Yes	Yes

Table 5-5 Software Option list

Software Options	Description	Install available or not				
		R1	R2	R3	R4	R4.2.5x
Scan Assistant	Provides an automated exam script that moves you through an exam step-by-step. This allows you to focus on performing the exam rather than on controlling the system and can help you to increase consistency while reducing keystrokes.	Yes	Yes	Yes	Yes	Yes
Stress Echo	Provides an integrated stress echo package, with the ability to perform image acquisition, review, image optimization, and wall segment scoring and reporting for a complete, efficient stress echo examination.	Yes	Yes	Yes	Yes	Yes
TVI (Tissue Velocity Imaging)	Calculates and color-codes the velocities in tissue. The tissue velocity information is acquired by sampling of tissue Doppler velocity values at discrete points	Yes	Yes	Yes	Yes	Yes
LS8 HRes Contrast Upgrade	Provides additional high resolution contrast imaging modes.	Yes	Yes	Yes	Yes	Yes
TUI (Tomographic Ultrasound Imaging)	Tomographic Ultrasound Imaging (TUI) is a visualization mode which presents data as parallel slices (planes) through the dataset.	N/A	Yes	Yes	Yes	Yes
VOCAL II	You use VOCAL (Virtual Organ Computer-aided Analysis) to visualize and calculate the volume of anatomical structures, such as a tumor lesion, cysts, and the prostate. VOCAL is available after a Static 3D or Real-Time 4D acquisition.	N/A	Yes	Yes	Yes	Yes
VCI Static	VCI (Volume Contrast Imaging) allows you to sweep smaller slices of data with a higher volume rate. The resulting image shows an average, integrated gray value of the tissue contained within the ROI.	N/A	Yes	Yes	Yes	Yes
Auto EF	Automated Ejection Fraction (AutoEF) is a semi-automatic measurement tool used for measurement of the global EF (Ejection fraction).	N/A	Yes	Yes	Yes	Yes
Needle Tracking	The device, accompanied by a navigation system and a sensor tipped needle, helps overcome many of the traditional challenges of existing ultrasound needle guidance such as needle visualization and deflection, determining entry points and the avoidance of critical anatomy.	N/A	Yes	Yes	Yes	Yes
Measure Assist Breast	Allows automatic contour and measurement of breast lesions.	N/A	Yes	Yes	Yes	Yes
Measure Assist OB	Allows automatic contour and measurement of BPD, HC, FL and AC.	N/A	Yes	Yes	Yes	Yes
Breast Productivity	Allows automatic contour and measurement of breast lesions.	N/A	Yes	Yes	Yes	Yes
Thyroid Productivity	Worksheet summary includes measurements and locations for nodule, parathyroid and lymph node.	N/A	Yes	Yes	Yes	Yes
Compare Assistant	Allows side-by-side comparison of previous ultrasound and other modality exams during live scanning.	N/A	Yes	Yes	Yes	Yes
Advanced Probes	Option kit for C2-9-D probe	N/A	Yes	Yes	Yes	Yes

Table 5-5 Software Option list

Software Options	Description	Install available or not				
		R1	R2	R3	R4	R4.2.5x
B Steer+	The user can enhance detectability of the biopsy in the tissue without slanting the entire B-Mode image. B Steer+ functionality is only available with linear probes.	N/A	Yes	Yes	Yes	Yes
Software DVR	Software DVR is a solution for recording images on the main screen to various medias. Software DVR supports wide screen resolution for recording. This feature also support playback from DVD media and USB device on console.	N/A	N/A	Yes	Yes	Yes
Shear Wave Elastography	A type of Elastography using force generated from a high intensity ultrasound pulse to generate a laterally travelling shear wave that is then observed and tracked using ultrasound. The velocity of the shear wave is used to generate an elasticity image.	N/A	N/A	Yes	Yes	Yes
AFI	Automated Function Imaging (AFI) is a semi-automatic measurement tool used for measurement of the regional functions of the left ventricle. The AFI tool is used as an optional decision support tool. The AFI tool is derived from 2D speckle tracking algorithm, which tracks and calculates the myocardial tissue deformation based on feature tracking on 2D grey scale loops.	N/A	N/A	Yes	Yes	Yes
STIC	STIC function is Spatio-temporal image correlation (STIC) is a new approach for clinical assessment of the fetal heart. STIC offers an easy to use technique to acquire data from the fetal heart and to aid in visualization with both two dimensional and three-dimensional (3D) cine sequences.	N/A	N/A	N/A	Yes	Yes
OmniView	Omniview function: Display non-orthogonal view along any drawn plane. Sub-menu on Sectional Visualization of 3D/4D mode.	N/A	N/A	N/A	Yes	Yes
FibroScan CAP	The FibroScan CAP, expressed in dB/m, is a measure of the attenuation of ultrasound signals in the tissue used as a tool for non-invasive assessment and quantification of steatosis. It is taken at the same time as the stiffness measurement, and concerns the same explored volume. This measurement is available on the FibroScan M+ and XL+ probes only.	N/A	N/A	N/A	Yes	Yes
Advanced Security	The advanced security software option enables a white listing type anti-virus protection for the system. When this option is enabled, it will add extra 30 to 60 minutes to the software load time.	N/A	N/A	N/A	Yes	N/A
HDLive	HDlive is an extraordinary rendering method generating amazingly realistic images of the human fetus from sonographic data. Through the use of an advanced illumination model, HDlive supports shadows, a virtual light source and advanced skin rendering techniques.	N/A	N/A	N/A	N/A	Yes
Tricefy	Tricefy is a cloud-based image viewer and a platform to archive, collaborate, and share.	N/A	N/A	N/A	N/A	Yes

Section 5-7
Hardware Options.

Table 5-6 Hardware option list

Hardware Options	SW Revision					Description
	R1	R2	R3	R4	R4.2.5x	
Power Assistant upgrade for R1	Y	-	-	-	-	
Shear Wave Hardware upgrade for IB	Y	Y	-	-	-	
Fibro/Extended Battery Hardware upgrade for IB	-	-	Y	-	-	
LS8 PENCIL CW hardware kit	Y	Y	Y	Y	Y	
LS8 4D Option	-	Y	-	-	-	
LS8 R3 Realtime 4D	-	-	Y	-	-	
LS8 R4 Realtime 4D	-	-	-	Y	Y	
LS8 DVR kit	Y	Y	-	-	-	
LS8 Power Assistant hardware	-	Y	Y	-	-	
LS8 R4 Power Assistant hardware	-	-	-	Y	Y	
Battery for Power Assistant	-	Y	Y	Y	Y	
Extended battery for scan	-	-	-	Y	Y	
LS8 R3 CW Doppler kit	-	-	Y	Y	Y	
FibroScan Module	-	-	-	Y	Y	
Peripheral Devices & Misc						
Polaris Side Tray	Y	Y	Y	-	-	
Wireless LAN (A4100)	-	Y	Y	-	-	
Wireless LAN (A6210)	-	Y*	Y**	-	-	* Running Change for R2 ** Japan model is different H-Cat
Wireless LAN (A6210) for LS8 R4	-	-	-	Y	Y	
USB 3 Pedal Foot Switch	Y	Y	Y	Y	Y	
Sonazoid Key Top	Y	Y	Y	-	-	
Sonazoid Key Top for LS8 R4	-	-	-	Y	Y	
TEE-RS DLP Adapter	-	Y	Y	Y	Y	
Powervar144k12vMG UPS	-	Y	Y	Y	Y	
Volume Navigation Option						
V-Nav kit with software key	Y	Y	-	-	-	
LS8 R3 V-Nav starter kit with software key	-	-	Y	-	-	
LS8 R4 V-Nav starter kit with software key	-	-	-	Y	Y	

Table 5-6 Hardware option list

Hardware Options	SW Revision					Description
	R1	R2	R3	R4	R4.2.5x	
LE8 R3 V-Nav starter kit with software key	-	Y	Y	Y	Y	
LS8 R3 Needle Tracking kit with software key	-	-	Y	-	-	
LS8 R4 Needle Tracking kit with software key	-	-	-	Y	Y	
Volume Navigation Stand	Y	Y	Y	Y	Y	
V-Nav Inside	-	-	-	Y	Y	
Volume Navigation Peripherals						
V-Nav Needle Tracking	-	Y	Y	Y	Y	
V-Nav Needle Tracking Storage Insert kit	-	Y	Y	Y	Y	
V-Nav Virtual Needle Tracker	-	Y	Y	Y	Y	
Virtual Tracker Sensor	-	Y	Y	Y	Y	
V-Nav eTRAX 18/20g starter kit	-	Y	Y	Y	Y	
V-Nav eTRAX starter kit - 12GA	-	Y	Y	Y	Y	
V-Nav eTRAX starter kit - 14GA	-	Y	Y	Y	Y	
V-Nav Active Tracker kit	-	-	Y	Y	Y	
V-Nav Active Tracker kit (MR)	-	-	Y	Y	Y	
Cardiac and ECG Option						
LS8 ECG Module (without ECG cables)	Y	Y	Y	-	-	
ECG kit without Cable	-	-	-	Y	Y	
LS8 ECG Cable - AHA	Y	Y	Y	Y	Y	
LS8 ECG cables - IEC	Y	Y	Y	Y	Y	
Peripheral Device Cabinet						
LOGIQ High Cabinet	Y	Y	Y	-	-	
LOGIQ Mid Cabinet	Y	Y	Y	-	-	
LOGIQ Low Cabinet	Y	Y	Y	-	-	
LOGIQ Side Cabinet	Y	Y	Y	-	-	
LOGIQ Drawer	Y	Y	Y	-	-	
LOGIQ S High Cabinet	-	-	-	Y	Y	
LOGIQ S Mid Cabinet	-	-	-	Y	Y	
LOGIQ S Low Cabinet	-	-	-	Y	Y	
LOGIQ S Side Cabinet	-	-	-	Y	Y	
LOGIQ S Drawer	-	-	-	Y	Y	

Table 5-6 Hardware option list

Hardware Options	SW Revision					Description
	R1	R2	R3	R4	R4.2.5x	
Optional Probe Holders						
LS8 Endocavity probe holder	Y	Y	Y	-	-	
LS8 R4 Endocavity probe holder	-	-	-	Y	Y	
LS8 Side Probe Holder	Y	Y	Y	-	-	
LS8 R4 Optional Probe Holder	-	-	-	Y	Y	
LS8 Small Probe Adapter	Y	Y	Y	-	-	
LOGIQ S Small Probe Adapter	-	-	-	Y	Y	
Probe Cable Hanger	Y	Y	Y	Y	Y	
Printer Option						
BW Sony UP-D897MD	Y	Y	Y	Y	Y	
UP-D898 BW Printer kit	Y*	Y*	Y	Y	Y	Running change for LOGIQ S8 R2 and LOGIQ E8. (not yet) * UP-D898 can be used on LOGIQ S8 R2.2.1 or later. UP-D898 can be used on LOGIQ S8 R2.1.1 or before, as “UP-D897 compati Mode”.
Color Sony UP-D25	Y	Y	Y	Y	Y	
LS8 Sony UP-D55 Digital Color A5 Printer	Y	Y	Y	Y	-	
Color Sony UP-DR80	-	Y*	Y	Y	Y	* UP-DR80 can be used on LOGIQ S8 R2.2.1 or later.
Color Inkjet Printer HP470 (Off-board)	Y	Y	Y	Y	Y	
Color Inkjet Printer HP100 (Off-board)	-	Y	Y	Y	Y	
Color Inkjet Printer HP6100 (Off-board)	-	-	Y	Y	Y	
HP OfficeJet Pro 8100 ePrinter (Off-board)	-	-	Y	Y	Y	
Printer install kit	Y	Y	Y	-	-	
Printer install kit for LS8 R4	-	-	-	Y	Y	
Printer install kit for LE8	-	Y	Y	Y	Y	
Isolated USB connector	-	-	Y	Y	Y	
Video Converter						
Universal Video Converter	-	Y	-	-	-	
LS8 UVC-2000 Option kit	-	Y*	Y	Y	Y	* Running change for LS8 R2 and LE8
LS8 UVC On-Board Installation kit	-	Y	Y	-	-	
LS8 R4 UVC On-Board Installation kit	-	-	-	Y	Y	

Table 5-6 Hardware option list

Hardware Options	SW Revision					Description
	R1	R2	R3	R4	R4.2.5x	
LS8 UVC Off-board installation kit	-	Y	Y	Y	Y	
LS8 Off-Board UVC AC Adaptor *	-	Y	Y	Y	Y	* Japan model is different H-Cat

5-7-1 LOGIQ S8 R4 - FibroScan Option

5-7-1-1 FibroScan Screen

Figure 5-10 FibroScan Screen

5-7-1-2 FibroScan Module Box

Figure 5-11 FibroScan Module Box

5-7-1-3 FibroScan mounting position

Figure 5-12 FibroScan mounting position

5-7-1-4 FibroScan Signal Connection

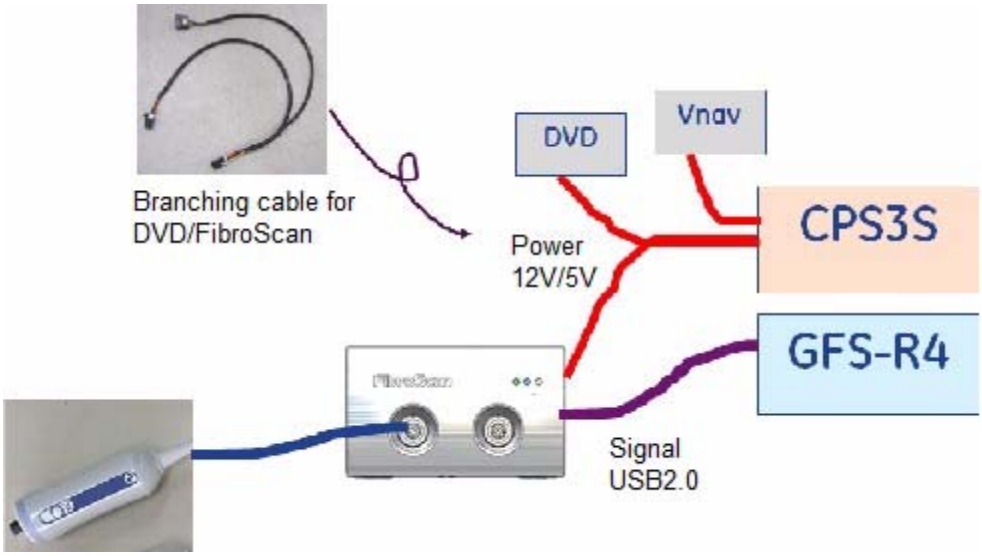
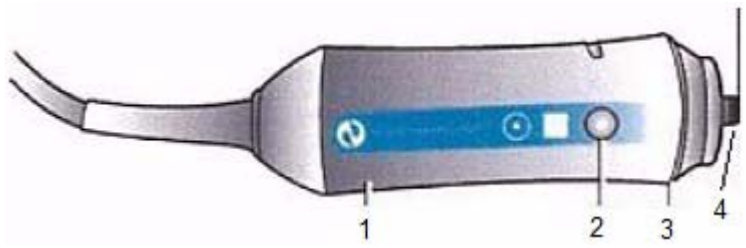


Figure 5-13 Signal Connection

5-7-1-5 FibroScan Probe



1.Electrodynamic transducer
2.Measurement button
3.Indicator light (LED)
4.Ultrasonic transducer

Figure 5-14 FibroScan Probe

5-7-1-6 FibroScan Touch Panel

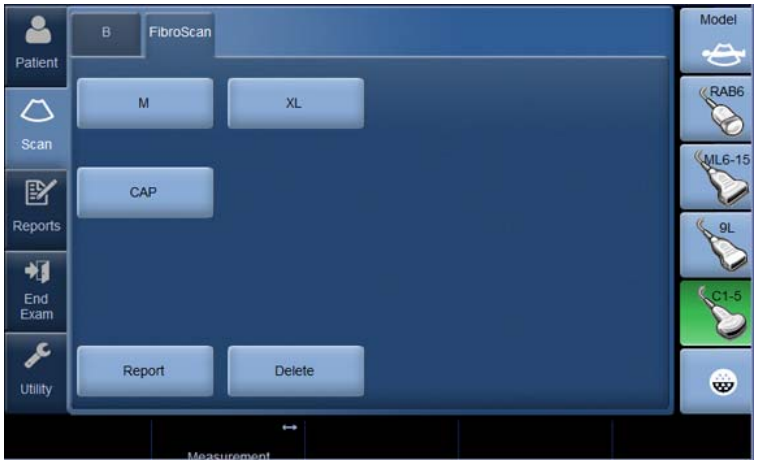
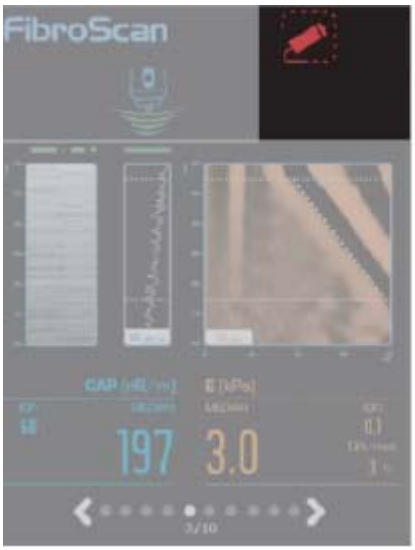


Figure 5-15 FibroScan Touch Panel

Preset Parameter	Description
M or XL	Press M to activate M+ probe. Press XL to activate XL+ probe. Note: If only one FibroScan probe is connected, the exam type is automatically activated when entering the FibroScan mode.
CAP	Activate the CAP measurement when the CAP option is installed. Note: If the CAP option is installed, the CAP button is automatically activated when entering FibroScan mode.
FibroScan Report	Activate FibroScan Report page.
Delete	Delete a group of measurements in an exam.
Measurement	Move right or left to advance through measurement results.

5-7-1-7 FibroScan Warning indicator

The following indicators display above the elastogram.

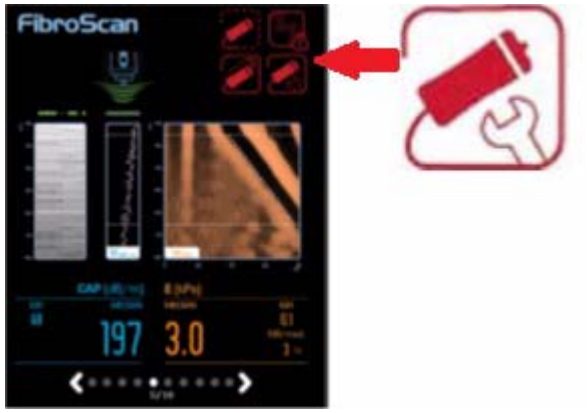


1.No compatible probe connected
2.Electromagnetic disturbances
3.Calibrate the probe

Figure 5-16 Warning indicators

5-7-1-8 FibroScan Probe Calibration

Calibration Indicator



- Probe needs to be calibrated every 2 years
- A message will be displayed 14 days prior calibration expiration date, as well as if the calibration has expired.
- When performing FibroScan Exam without the calibration, the exam may continue but the Calibration icon will be showed on FibroScan View.

Section 5-8
Regional and Peripheral Options

5-8-1 Regional Options.

Table 5-7 Regional Option

Optional Power Cables
Destination Set - *UK*
Destination Set - *South Africa*
Destination Set - *Argentina*
Destination Set - *Israel*
Destination Set - *Switzerland*
Destination Set - *Denmark*
Destination Set - *US*
Destination Set - *Japan*
Destination Set - *Australia/New Zealand*
Destination Set - *China*
Destination Set - *India*
Destination Set - *Italy*
Destination Set - *Brazil*
Europe 220V power cable
Optional Language Keyboards
Greek Keyboard
Norwegian/Danish Keyboard
Russian Keyboard
Swedish Keyboard

5-8-2 Peripheral Options.

Table 5-8 Peripheral Option

Printers
Sony UP-D897/D898
Sony UP-D25MD

Section 5-9
Air Flow Distribution

5-9-1 Air Flow Distribution

Through the filter grid on the front of the system, air flow into the LOGIQ S8.

By means of the 1 FAN, air is blown through the nest-box, and the warm air exits the system through holes in the left side panel and rear of the system.

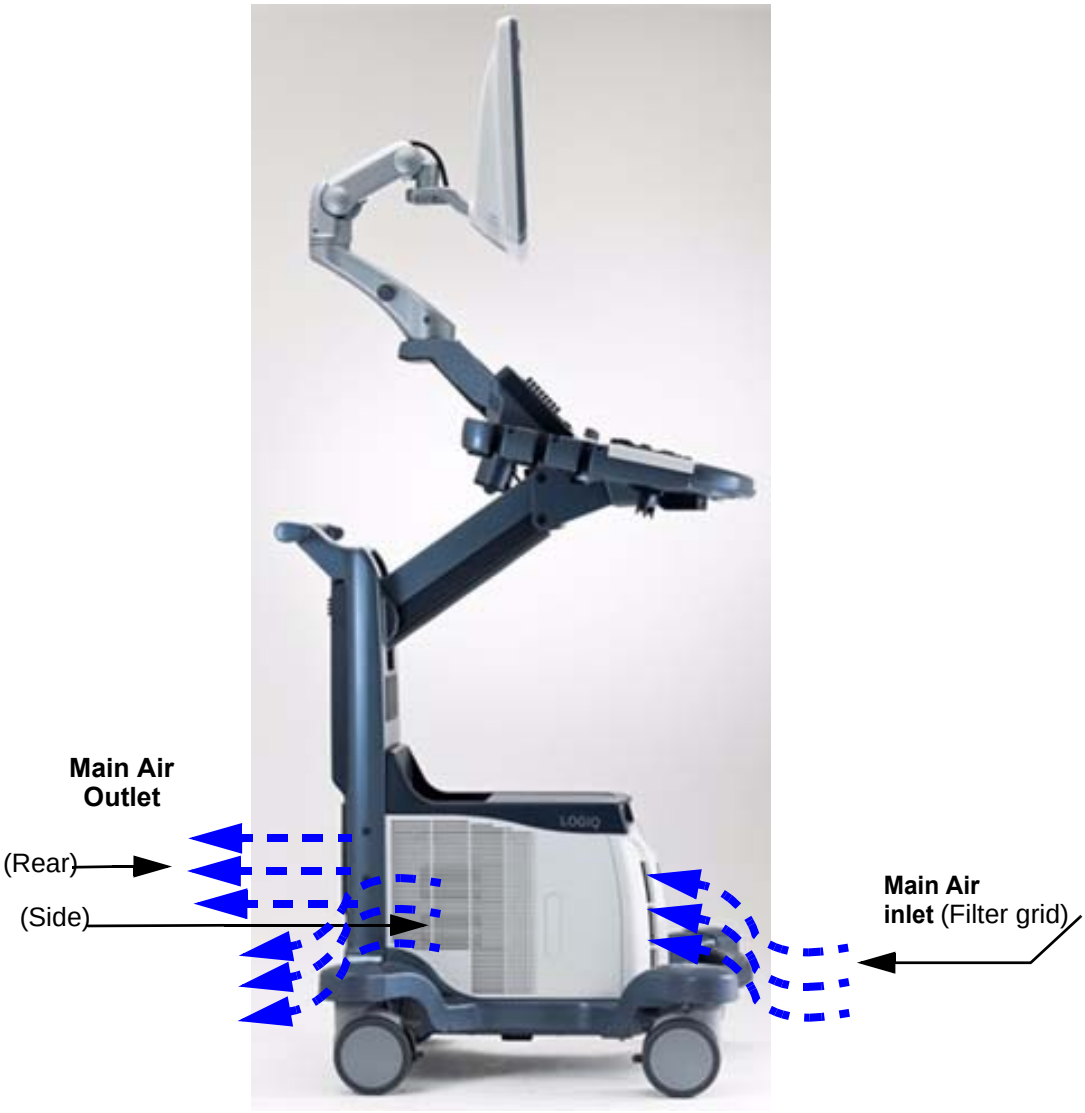


Figure 5-17 Air Inlet/Outlet

Section 5-10
Product Manuals

The information needed to use and service the LOGIQ™ S8 is collected in the documents described in this section.

NOTE: Dates on screenshots are represented in MM/DD/YYYY format throughout the manual. Information on how to change the LOGIQ™ S8's date can be found in Customizing Your System, Chapter 10 in the LOGIQ™ S8 User Manual.

5-10-1 Purpose of the operator manual(s)

The operator manuals should be fully read and understood before operating the LOGIQ S8 and also kept near the unit for quick reference.

The online versions of the operator manuals are available via the Help function (F1 key) on LOGIQ S8's operator panel.

The translated user manuals are available on a CD-ROM delivered with the system. They are also available on the Common Documentation Library (CDL) for downloading.

5-10-2 User documentation

- LOGIQ™ S8 User Manual
- LOGIQ™ S8 Advanced Reference Manual
- LOGIQ™ S8 User Guide
- LOGIQ™ S8 Release Notes
- LOGIQ™ S8 eDoc CD includes all languages
- LOGIQ™ S8 Privacy and Security Manual

5-10-3 Basic Service documentation

- LOGIQ™ S8 Basic Service Manual

5-10-4 Service/Proprietary documentation

- LOGIQ™ S8 Proprietary Service Manual
- LOGIQ™ S8 Service Notes

5-10-5 Advanced Information

GE Service only documentation

- LOGIQ™ S8 Upgrade/Option installation manuals
- LOGIQ™ S8 FMI (Field Modification Instructions)
- LOGIQ™ S8 Option Manuals

Section 5-11
LOGIQ E8

LOGIQ E8 based on LOGIQ S8. So LOGIQ E8 uses same electrical parts and application software.

LOGIQ E8 has a similar console to LOGIQ S8. But these consoles are not able to change to each other. Because the product name is deferent in regulatory.

Different point are

1.) LOGIQ E8 has only one cabinet design

2.) LOGIQ E8 Emblem is attached on existing LOGIQ S8 OPIO

3.) Universal Video Converter is the standard configuration for LOGIQ E8. This universal video converter needs a fan assy. for cooling.

4.) LOGIQ E8 SW Option

LOGIQ E8 does use LOGIQ S8 application software. LOGIQ E8 SW is required to boot system as LOGIQ E8.

When LOGIQ E8 Software Option Key is enabled, the system behavior changes as follow;

- "LOGIQ E8" is described in splash screen
- "LOGIQ E8" displays as Probe direction mark
- The Device type and Device Name prefix on InSite is different from LS8
- The backup/restore functions is incompatible with LOGIQ S8
- The Raw Data is incompatible with LOGIQ S8. LOGIQ S8 is not able to read LOGIQ E8 Raw Data and vice versa

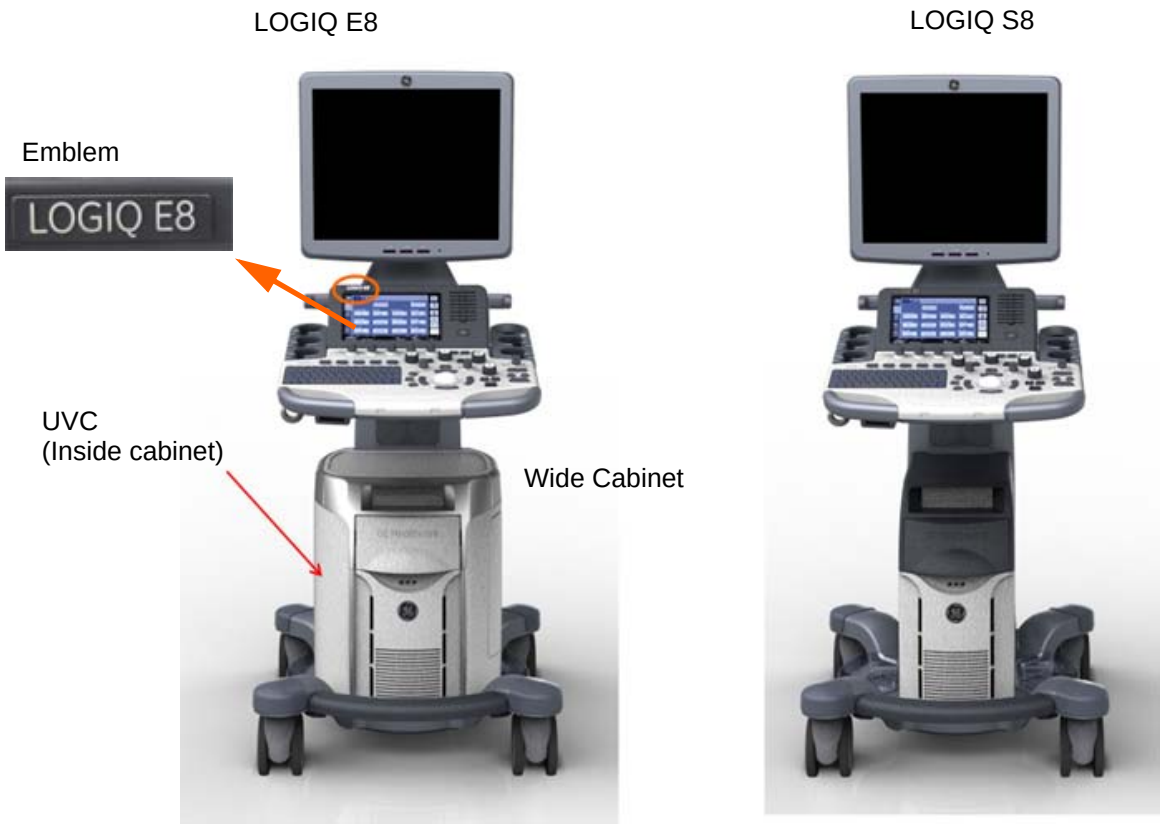


Figure 5-18 Difference in appearance between LOGIQ S8 and LOGIQ E8 (R2 - R3 system)

Figure 5-19 LOGIQ E8 Emblem position - R4 system

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Chapter 6
Service Adjustments

Section 6-1
Overview

6-1-1 Purpose of this chapter

This chapter describes how to test and adjust the mechanical capabilities of the sytsem that may be out of specification. Although some tests may be optional they should only be performed by qualified personnel.

NOTE: When not otherwise specified, the contents of this manual and reference to LOGIQ S8 applies to all LOGIQ S8/LOGIQ E8/LOGIQ S8 Vet models.

Section 6-2
Monitor Adjustment

6-2-1 19” LCD Monitor

The digital control panel is located at the front of the color monitor. **It is NOT recommended to change the pre-adjusted settings.**
However, if you are not satisfied with the factory settings, use these controls to program those you prefer in each resolution.

NOTE: All changed values will only be saved by selecting “Exit” from the OSD. If not, the adjusted values will be lost after loss of power.

Figure 6-1 Monitor Adjustment buttons

Table 6-1 Contents in this section

Section Number	Main Menu	Sub Menu	Range	Setting for LOGIQ S8
6-2-1-1	Picture	Contrast	0~100%	100%
		Brightness	0~100%	80%
		Colortemp/Gamma Select	2.2 or 2.4	2.4
		Colortemp/Mode	9000K/11000K/13000K/15000K/ USER	13000K
6-2-1-2	Function	Scale	Full/5:4/Native	Full
		Information		
		Memory Recall		Factory Default
		SBC	ON/OFF	ON
6-2-1-3	OSD	Language	English/German/French/Spanish/ Italian/Swedish/Chinese/Japanese	English
		H-Position	0~100%	50%
		V-Position	0~100%	50%
		Half Tone	0~100%	50%
-	Exit	When finishing the Adjusting Menu, select the **EXIT** (middle) and press the **MENU** (middle) key.		

NOTE: 1280 x 1024, 60Hz.

6-2-1-1 Brightness/Contrast

6-2-1-1-1 Brightness

Adjusting the monitor's contrast and brightness is one of the most important factors for proper image quality. If these controls are set incorrectly, the Gain, TGC, Dynamic Range and even Acoustic Output may have to be changed more often than necessary to compensate.

The proper setup displays a complete gray scale. The lowest level of black should just disappear into the background and the highest white should be bright, but not saturated.

1.) Adjust the BRIGHTNESS by pressing the < **LEFT** or **RIGHT**> button to decrease/increase value.

Figure 6-2 Brightness Adjust

6-2-1-1-2 Contrast

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the Picture -> Contrast by pressing the < LEFT or RIGHT > button to decrease/ increase cursor and the **MENU** (middle) key.
3.) Adjust the CONTRAST by pressing the < LEFT or RIGHT > button to decrease/increase the value. (Default : 80)

Figure 6-3 Contrast Adjust

NOTE: Brightness and Contrast should be adjusted at examination room light conditions.

6-2-1-1-3 Gamma

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.

2.) Select the Picture -> Color Temp -> GAMMA by pressing the < **LEFT** or **RIGHT** > button to move the cursor and the **MENU** (middle) key.

3.) Select 2.2 or 2.4 by pressing the **MENU** (middle) key.

6-2-1-1-4 Mode

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.

2.) Select the Picture -> Color Temp -> MODE by pressing the < **LEFT** or **RIGHT** > button to move the cursor and the **MENU** (middle) key.

3.) Select desired value by pressing the **MENU** (middle) key.

4.) If selecting USER mode, adjust the R/G/B value by pressing the < **LEFT** or **RIGHT** > button to decrease/increase the value.

6-2-1-2 Function

Figure 6-4 Function

6-2-1-2-1 Scale

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the FUNCTION -> Scale by pressing the < **LEFT** or **RIGHT** > button to move the cursor and the **MENU** (middle) key.
3.) Select FULL/5:4/NATIVE by pressing the < **LEFT** or **RIGHT** > button to decrease/increase the value and the **MENU** (middle) key.

6-2-1-2-2 Information

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the FUNCTION -> INFORMATION by pressing the < **LEFT** or **RIGHT** > button to move the cursor and the **MENU** (middle) key.

Figure 6-5 Information

6-2-1-2-3 Memory Recall

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.

2.) Select the FUNCTION -> MEMORY RECALL by pressing the < **LEFT** or **RIGHT** > button to move the cursor and the **MENU** (middle) key.

NOTE: MEMORY RECALL is Factory default. If selecting MEMORY RECALL, all settings will be back to factory default status.

6-2-1-2-4 SBC

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.

2.) Select the FUNCTION -> SBC by pressing the < **LEFT** or **RIGHT** > button to move the cursor and the **MENU** (middle) key.

3.) Select ON/OFF by pressing the < **LEFT** or **RIGHT** > button to decrease/increase the value and the **MENU** (middle) key. (Default : ON)

6-2-1-3 OSD

Figure 6-6 OSD

6-2-1-3-1 Language

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the OSD -> LANGUAGE by pressing the < **LEFT** or **RIGHT** > button to move the cursor and the **MENU** (middle) key.
3.) Select English/German/French/Spanish/ Italian/Swedish/Chinese/Japanese by pressing the < **LEFT** or **RIGHT** > button to decrease/increase the value and the **MENU** (middle) key. (Default : English)

6-2-1-3-2 H-Position

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the OSD -> H-POSITION by pressing the < **LEFT** or **RIGHT** > button to decrease/increase cursor and the **MENU** (middle) key.
3.) Adjust the H-POSITION by pressing the < **LEFT** or **RIGHT** > button to decrease/increase the value. (default : 50)

6-2-1-3-3 V-Position

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the OSD -> V-POSITION by pressing the < **LEFT** or **RIGHT** > button to decrease/increase cursor and the **MENU** (middle) key.
3.) Adjust the V-POSITION by pressing the < **LEFT** or **RIGHT** > button to decrease/increase the value. (default : 50)

6-2-1-3-4 Half Tone

1.) Press the **MENU** (middle) key of the monitor controls over 10 sec.
2.) Select the OSD -> HALF TONE by pressing the < **LEFT** or **RIGHT** > button to decrease/increase cursor and the **MENU** (middle) key.
3.) Adjust the HALF TONE by pressing the < **LEFT** or **RIGHT** > button to decrease/increase the value. (default : 50)

6-2-2 22” (OLED) and 23” Wide Monitor Adjustment

NOTE: There are buttons on the rear cover of the 22" wide monitor (OLED), DO NOT use those buttons for adjustment. The system will override the parameter(s) and the monitor does not have capability to retain parameters.

NOTE: All Monitor settings have been optimized at the factory, so normally, there should be no need for any further adjustments.

1.) Go to Utility second touch panel.

2.) Adjust Room profile, Color Profile, Gamma, Brightness/Contrast (Room profile - User defined) and Color Space (22” OLED monitor only) as necessary.

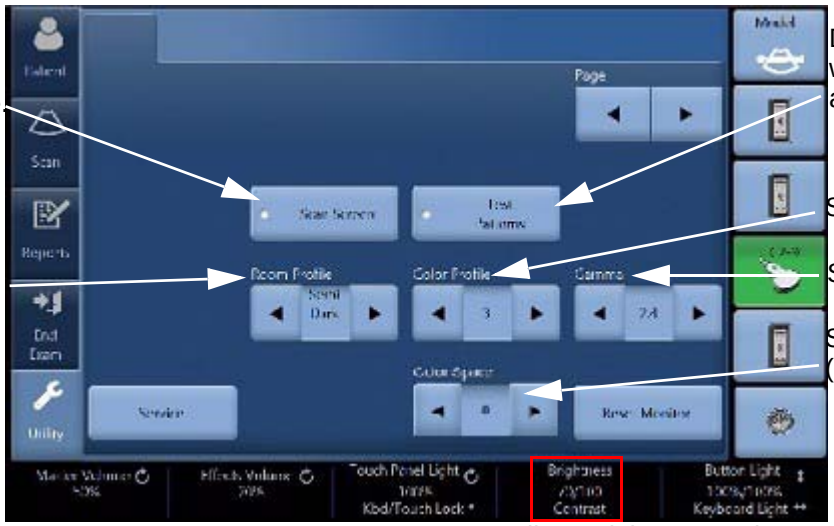


Figure 6-7 Utility second page - 22” OLED Monitor example

Table 6-2 Parameters for Wide Monitor

Parameter	Range	Note
Room Profile	Dark/ Semi Dark/ Light/ User Defined	
Color Profile	0, 1, 2, 3	
Gamma	2.2 or 2.4	
Color Space (OLED only)	0, 1, 2	
Brightness (Room Profile - User Defined)	0 - 100	
Contrast (Room Profile - User Defined)	0 - 100	

6-2-2 22" (OLED) and 23" Wide Monitor Adjustment (cont'd)

6-2-2-1 Scan Screen

In order to view the monitor while adjusting the Contrast/Brightness and Color Profile, press the ***Scan Screen*** on the second Utility Page.

1.) Press ***Scan Screen***. The scan screen displays on the main display while the Utility touch panel is active.

2.) Adjust Room Profile/Color Profile as necessary.

6-2-2-2 Room Profile

Room Profile changes Brightness/Contrast of main display.

If "User Defined" is selected, the user can adjust Brightness/Contrast by Brightness/Contrast control at the bottom of the Touch Panel.

NOTE: Brightness/Contrast setting is displayed only when touch panel has Room Profile button.

NOTE: Brightness/Contrast setting is changeable only when Room Profile setting is "User Defined".

In Utility -> System -> System Display, you can select "Last Used" (Factory default) for Room Profile.

If you select and save "Last Used" in this page, the LOGIQ S8 starts with last used Room Profile setting every time.

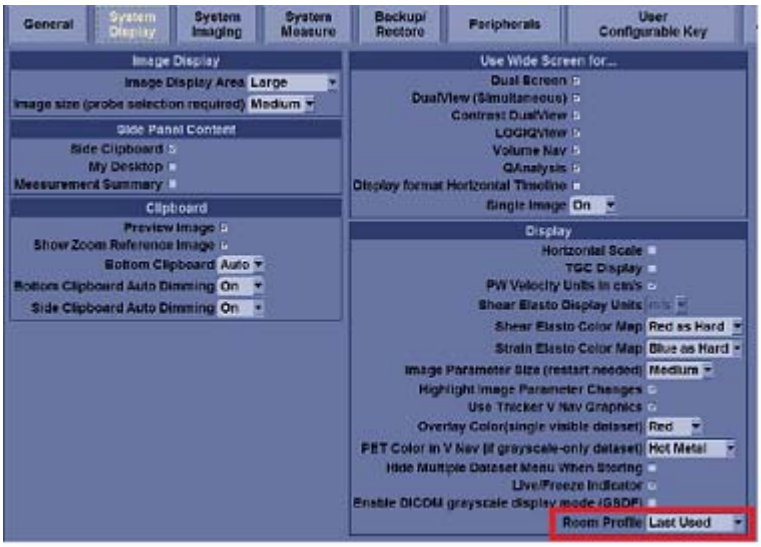


Figure 6-8 Room Profile preset

6-2-2-3 Color Profile

Color Profile controls color temperature.

6-2-2-4 GSDF control

GSDF control is located in Utility -> System -> System Display.

Figure 6-9 GSDF Control

Section 6-3
Volume Navigation Calibration Procedure

6-3-1 Purpose of this section

The Volume Navigation Calibration Procedure within the LOGIQ S8 is described in this section.

6-3-2 Overview

The Volume Navigation system is factory calibrated. However, small variations in the electromagnetic sensors, sensor brackets and the probes themselves can create system-to-system variation. This procedure is a means to do a system-specific calibration correction.

Note that the field calibration only applies to the specific type of probe (9L-D, ML6-15-D, C1-5-D, e.g.) that is used. Therefore, it may be necessary to repeat this procedure for each probe type that a customer owns.

6-3-3 Equipment

Use a phantom (optional) with distinguishable points that can be scanned from at least two directions (top and side, e.g.). It is best to use a special “calibration phantom” (optional) that has target points in the phantom (optional) and has been developed for this purpose. Note that the strings in many phantoms (optional) are not a good choice because it is not easy to specify a particular point along the string.

6-3-4 Setup

Connect a service key to the system. Set the system up for V Nav by connecting the transmitter and sensors. Attach the sensor/biopsy bracket to the probe, making sure to use the correct bracket for the probe. Connect sensors 1 and 2, assuring that their positions are not swapped. Put the phantom (optional) in a location where it does not rock or otherwise move while it is being scanned. Make sure to avoid areas with metal. Adjust the transmitter so that the bottom of the transmitter is at about the same level as the top of the phantom (optional). The top, center of the phantom (optional) should be about 8-16 inches (20-40 cm) from the face of the transmitter.

The calibration environment **must** be tested for electromagnetic field distortions. Calibrating in an environment with electromagnetic field distortions will likely generate a field calibration correction less accurate than the factory calibration.

1.) Enter V Nav by pressing the **V Nav** key.

2.) Set the **Magnetic Distortions** control (see the touch panel) to “Show All.”

- Move the windows pointer over the 2nd Environmental Quality Indicator in the upper left corner of the screen to initiate a mouse over window.

3.) Move the transducer across the surfaces of the phantom (optional) where you will be scanning.

The absolute value of the magnetic distortion reading (“1-2 Distortion”) should be consistently less than 1 mm, especially since the transducer is held steady in one location. It is also important that the reading is not cycling quickly between values such as continuously looping from -0.2 to 0.6. The environmental quality for both sensor 1 and sensor 2 should be in the green range, preferably at 6 or 7 bars.

Scanning the phantom (optional), place a GPS Marker on a point of interest. Holding the probe steady, the point should not drift or move in a large circle. Turn the transducer 90 degrees and confirm that the GPS Marker is still tracking the point of interest.

Problem 1 – Distortion reading is too large. Attempt to adjust the environment by removing or moving away from metal and adjusting the placement of the transmitter. If the distortion is not updating at all, the second sensor may be bad.

Problem 2 – Distortion is cycling or GPS Marker is circling when the probe is steady. Make sure the transmitter is close enough to the phantom (optional).

Problem 3 – The GPS Marker does not track the point of interest when the transducer is turned. Verify that sensors 1 and 2 are not swapped.

6-3-5 Measure Initial Accuracy

In order to know if the calibration correction is good, you need a baseline measurement of the current accuracy.

1.) Identify a point in the phantom (optional) that you can see from multiple angles. For example, from the top of the phantom (optional), from the top of the phantom with the probe turned 90 degrees and from the side of the phantom. A point at approximately 6 cm depth is recommended.

2.) Select the **GPS Marker** key and select Delete All.

3.) Select the **Measure Accuracy** key.

4.) Scan to the first point of interest. Holding the probe steady, move the Windows Pointer over the point of interest and press the **Right Trackball** key. A GPS Target Marker (labeled “1”) is placed on the point of interest.

5.) Change the orientation on the probe 90 degrees and mark the same point again. Write down the results shown on the status bar.

(Prior to Correction) Distance #-# = _____ [mm]

(After Correction) Distance #-# = _____ [mm]

6.) Return to the original probe orientation from step 3 and mark the point a third time. This point should be at the same location as the point from step 3.

7.) Change the orientation of the probe so that you are scanning the same point again, but from the side of the phantom (optional). Mark the point a fourth time. Write down the results shown on the status bar.

(Prior to Correction) Distance #-# = _____ [mm], mean (2 values) = _____mm

(After Correction) Distance #-# = _____ [mm], mean (2 values) = _____mm

6-3-6 Perform Calibration

The calibration buttons referred to are found on page 2 of the V Nav touch panel.

NOTE: Use the service key to see the calibration buttons.

To perform a calibration you need to identify at least 3 different “points of interest” in the phantom (optional) and scan each of these points from at least 3 different “views.” If the point of interest is accessible from two surfaces of the phantom (optional), four views are recommended. If the point of interest is accessible from three surfaces of the phantom (optional), six views are recommended.

1.) Identify a point in the phantom (optional) that you can see from multiple angles. For example, from the top of the phantom (optional), from the top of the phantom (optional) with the probe turned 90 degrees and from the side of the phantom (optional).

2.) Select the **Calibration Delete** button and choose “All.” A message appears on the status bar indicating the calibration procedure has been reset. Repeat this step at any time if you want to start the process over.

3.) Select the **Calibration Next Point** button. A message on the status bar appears indicating that Point 1 has been added.

4.) Scan to the first point of interest. Holding the probe steady, move the Windows Pointer over the point of interest and press the **Right Trackball** key. A GPS Target Marker (labeled “T”) is placed on the point of interest and a message “Calibration Correction: Input Accepted” appears on the status bar. If this view of the point was not marked where you wanted it, remove it by selecting Calibration Delete -> Last View.

5.) Identify a second view of the point of interest identified in step 5. For example, turn the probe 90 degrees or move the probe to a different surface of the phantom (optional). The GPS marker will help to guide back to the same point of interest; make sure that you are marking the same point of interest. Once you are at the same point, use the Windows Pointer and the **Right Trackball** key as before to mark the point of interest. If this view of the point was not marked where you wanted it, remove it by selecting Calibration Delete -> Last View. If you are unable to confidently get a second view of the point of interest, you can select the Calibration Delete -> **Last Point** key and return to Step 4, 11, 14 or 16 depending on how you got to this step.

6.) Identify a third view of the point of interest identified in step 5. For example, turn the probe 90 degrees or move the probe to a different surface of the phantom (optional). Note that this view should be different than the view used in step 5 and different than the view used in step 6. The GPS marker will help to guide back to the same point of interest; make sure that you are marking the same point of interest. Once you are at the same point, use the Windows Pointer and the **Right Trackball** key as before to mark the point of interest. If this view of the point was not marked where you want it, you can remove it by selecting Calibration Delete -> Last View. If you are unable to confidently get a third view of the point of interest, you can select the Calibration Delete -> **Last Point** key and return to Step 4, 11, 14 or 16 depending on how you got to this step.

7.) Optionally, you may identify additional views of the point of interest from step 5. For example, turn the probe 90 degrees and take another view from the second surface. If the point can be seen from a third surface this could also be used for one or more additional views.

8.) At this stage, you have completed at least 3 views of the first point of interest.

6-3-6Perform Calibration (cont'd)

9.) Select the **Calibration Next Point** button. A note on the status bar appears indicating that the Point 2 has been added.

10.) Repeat steps 5 through 8 for a point of interest that is away from the first point of interest.

11.) At this stage, you have completed at least 3 views of the second point of interest.

12.) Select the **Calibration Next Point** button. A note on the status bar appears indicating that Point 2 has been added. Repeat steps 5 through 8.

13.) Repeat steps 5 through 8 for a point of interest that is away from the first and second points interest and does not create straight lines between points 1, 2 and 3.

14.) At this stage, you have completed at least 3 views of the third point of interest.

15.) Optionally, you may identify additional points of interest by selecting the **Calibration Next Point** button and repeating step 5 through 8.

16.) Select the **Calibration Calculate** button on the touch panel. A series of calculations are performed in 5 steps. Once the fifth step is complete a value appears on the status bar. This message appears briefly, so watch for it. If you miss this message, press **Calibration Calculate** again to redo the computations and re-display the result. Record your results.

Init. Mean Dev. = _____, Opt. Mean Dev. = _____

The lower the value, the more likely the calibration correction is good.

17.) At this point, the calibration correction is being used but it has not been saved for later use. Following the steps in the Measure Initial Accuracy section to evaluate the performance of the calibration correction.

18.) If the correction is better than the Initial Accuracy, it may be saved with the **Calibration Write** key. The key automatically stores the value with other system presets. If the accuracy is not better than the initial accuracy, exit and reenter V Nav to discard the results. Another calibration correction can be attempted by starting at step 3.

Problem 1 – **Calibration Next Point** button is not on the touch panel. Connect a service key, exit V Nav, enter V Nav and go to page 2 of the touch panel.

Problem 2 – If you are confused about the number of points and views you have performed, restart the process starting with Step 3.

Chapter 7
Diagnostics/Troubleshooting

Section 7-1
Overview

7-1-1 Purpose of this chapter

This section describes how to setup and run the tools and software that help maintain image quality and system operation. Basic host-, system-, and board-level diagnostics are run whenever power is applied. Some Service Tools may be run at the application level.

There may be a time when it would be advantageous to capture trouble images and system data (logs) for acquisition through remote diagnostics or to be sent back to the manufacturer for analysis. There are different options to acquire this data that would give different results.

NOTE: When not otherwise specified, the contents of this manual and reference to LOGIQ S8 applies to all LOGIQ S8/LOGIQ E8/LOGIQ S8 Vet models.

7-1-2 Contents in this chapter

Section 7-2
Service Platform

7-2-1 Introduction

The Service Platform will increase service productivity and reduce training and service costs.

7-2-2 Access / Security

The Service Platform has different access and security user levels. Each user is only granted access to the tools that are authorized for their use.

- Local Access (R1 to R4): via Utility - Service
- Remote Access to Service Platform: This offers GE technicians the possibility to view the entire customer's desktop and operation system. Remote access to the LOGIQ S8 requires permission and customer input to run diagnostics.

7-2-3 Local Access (R1 to R4)

1.) If not already in read mode, freeze the image.

2.) Select **Utility** on the Touch Panel and then touch **Service**. Service Login opens.

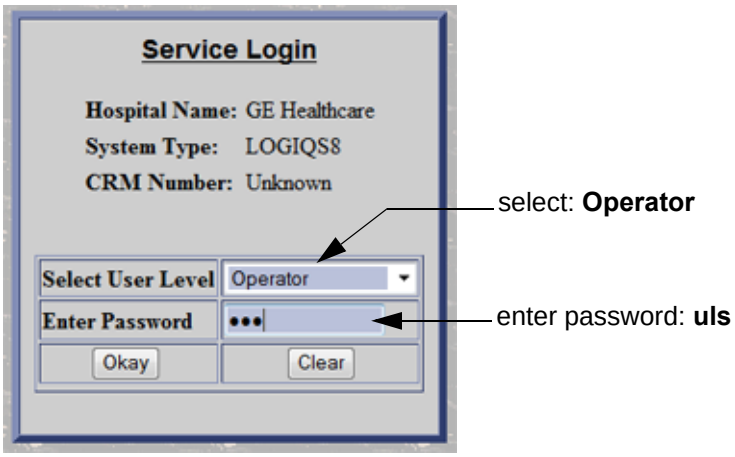


Figure 7-1 Service Login (R1 to R4)

3.) Select "Operator" from the pull-down menu, enter the password "uls" and then click **Okay**.

4.) GEHC Service Home Page appears.

The Common Service Desktop (CSD) is started and the Home page - containing Basic System Information - appears. The navigation bar at the top of the screen allows to select different tools.

For more detailed information and description, refer to Section 7-4 "Service Desktop (CSD) - R1 to R4" on page 7-20 or Section 7-6 "Service Desktop (R4.2.5x and later)" on page 7-46.

7-2-4 Remote Access to Service Platform

7-2-4-1 General

If the console is setup to connect to InSite server (refer to Section 3-13 "Setting up InSite Connection (R1 to R4)" on page 3-82), then remote access technology may provide GE technicians the possibility to view the entire customer's desktop and operation system for diagnostics and trouble shooting.

Using VCO (Virtual Console Observation) a service technician or the OnLine Center can access and modify all PC settings and programs or run diagnostics on the customer's ultrasound scanner. Remote access to the LOGIQ S8 scanner requires permission and customer input before a GE service technician or OLC can access the customer's ultrasound scanner remotely. "Disruptive Mode" can be selected by the customer directly on the LOGIQ S8 ultrasound system, or remotely by the service technician or OLC.

7-2-4-2 How the Customer enables/disables Disruptive Mode and VCO

1.) If not already in read mode, freeze the image.

2.) Move the cursor to the GE InSite icon and press the right trackball key (= right-click).

3.) Select ***Connect Clinical Lifeline***. This activates "Disruptive Mode" and "VCO" for the application OLC to quickly assist the customer.

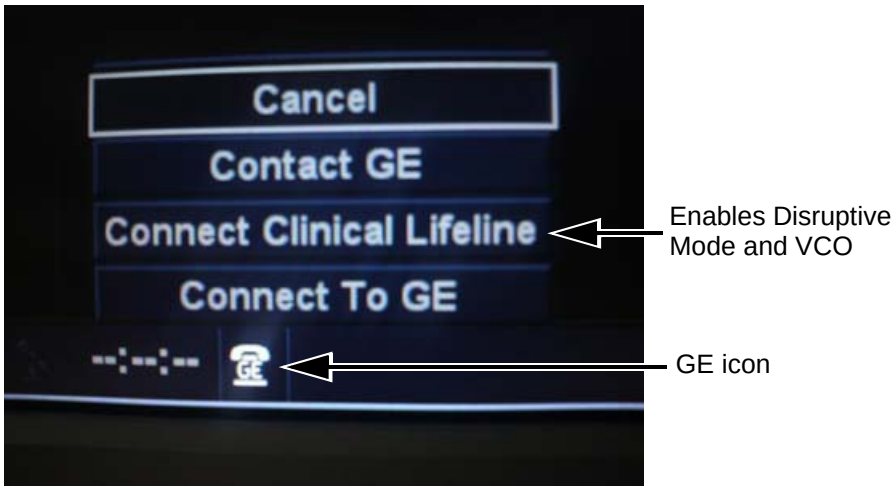


Figure 7-2 Connect Clinical Lifeline (R1 to R4)

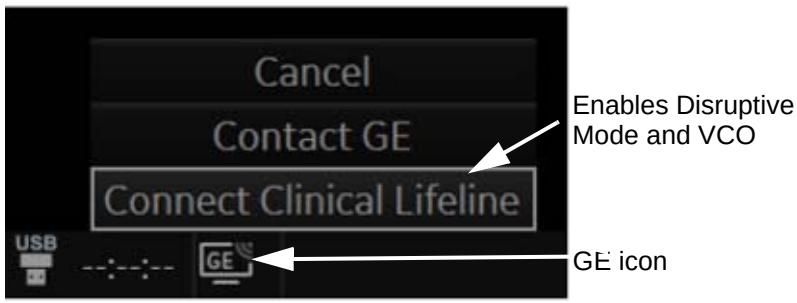


Figure 7-3 Connect Clinical Lifeline (R4.2.5x)

NOTE: To disable disruptive mode, select "CANCEL".

7-2-5 Customer Granting Full Remote Access Permission to GE Service Technician

7-2-5-1 If GE Service Technician requests Remote Access Permission

If a GE Service technician requests remote access to your LOGIQ S8 scanner, following “InSite Notification” appears on the systems screen.

1.) Enable “Disruptive Mode” feature by confirming Yes.

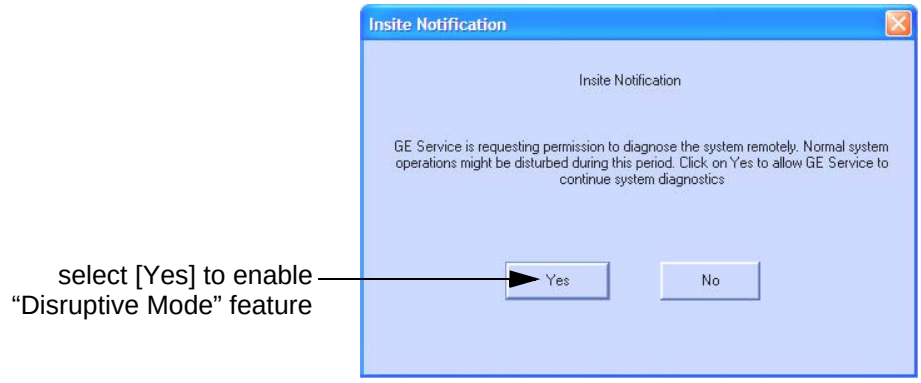


Figure 7-4 Insite Notification

NOTE: If the customer does not wish to have diagnostics running at the time of the request, they select No. A message is sent back to the OLC or FE that “Disruptive Mode” is not enabled.

NOTE: The user must have Remote service access rights to authorize disruptive mode.

Section 7-3
Gathering Troubleshooting Data (R1 to R4)

7-3-1 Purpose of this Section

Problem images and system data (logs) can be acquired at the device or through remote diagnostics (InSite). These data can be used to perform service at the device, or can be sent back to the manufacturer for analysis.

7-3-2 Contents in this section

7-3-3 Collecting Vital System Information

7-3-3-1 Collecting System Information

The following information is necessary to properly analyze data or images being reported as a malfunction or being returned to the manufacturer:

NOTE:This information is normally collected with the Alt+D or Gather Logs utility.

- Product Name = LOGIQ S8 or LOGIQ E8

1.) From the touch panel, select Utility -> System-> About.

Figure 7-5 System About - R1

Figure 7-6 System About - R2 and later

2.) Record software version and System Image version

Applications Software

- Software Version
- Software Revision (R2.x.x and later)
- Software Part Number
- Build View
- Build Date

System Base Image Software

- Base Image Revision
- Image Part Number
- Image Date

7-3-3-2 Request for Service (RFS)

NOTICE Service Connectivity has to be checked out once before you can request for service. i.e., Service platform has to be configured properly; see: Section 7-4 "Service Desktop (CSD) - R1 to R4" on page 7-20.

1.) Position the Windows pointer on the GE InSite icon at the bottom of the display.

2.) Press the right Trackball Set key. Select Contact GE. The RFS screen opens.

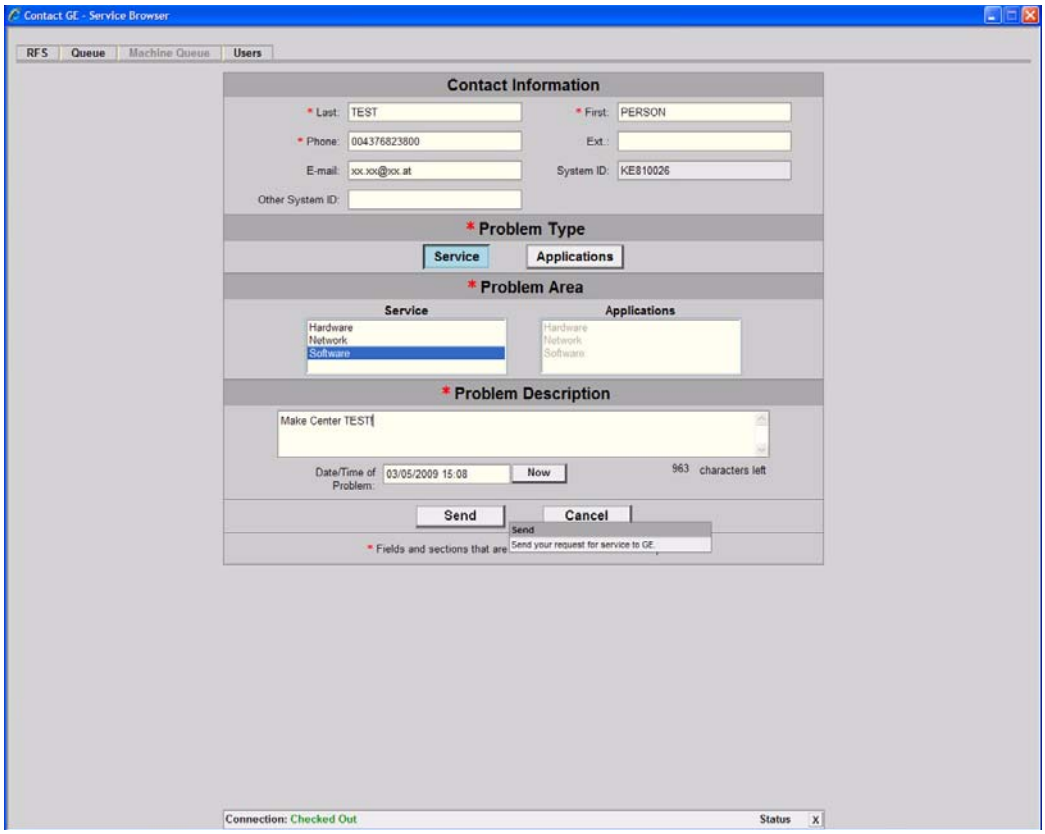


Figure 7-7 Contact GE - Request for Service

7-3-3-2 Request for Service (RFS) (cont'd)

A request confirmation screen is displayed:

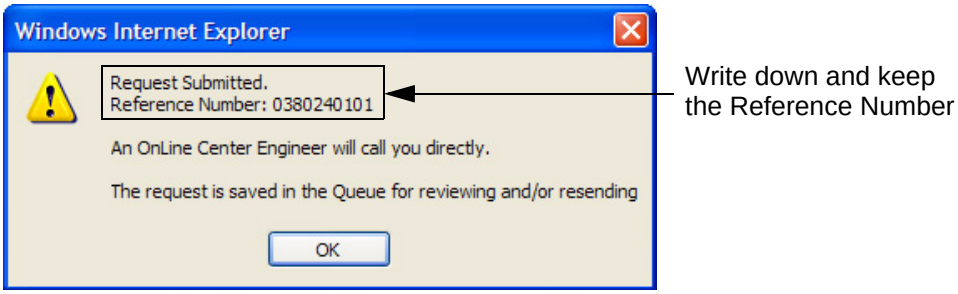


Figure 7-8 Request submitted

3.) Write down and keep the Reference Number for follow up procedures, then click **OK**.

NOTE: f the service platform is not configured an Error message is displayed. The request is **NOT sent**!
The request is saved in QUEUE for reviewing and/or re-sending.

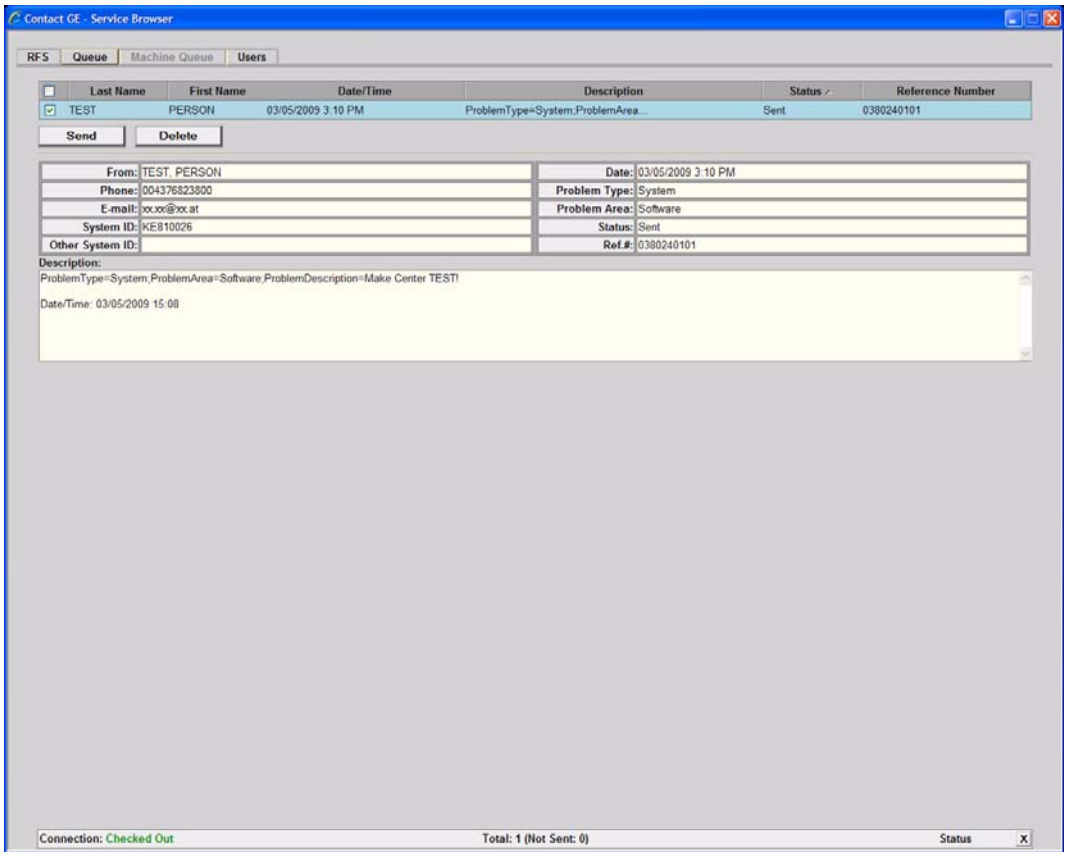


Figure 7-9 Contact GE - Queue

7-3-4 Collecting a Screen Capture with Logs

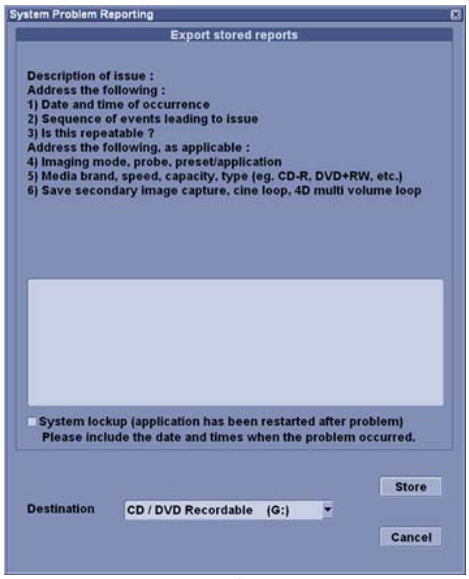
NOTE: Login before gathering log files.

To gather log files, the system requires a user to be logged in. The error message below appears when hitting Alt+D key without any user logged in.

If the system malfunctions, press the Alt+D keys simultaneously. This Alt+D function is available at all times, and collects a screen capture of the image monitor, user-defined presets, and the following logs:

- Keyboard Shadow Log
- Error Logs
- Crash Log
- Vital Product Data
- DICOM Logs
- Windows Event Logs
- Diagnostic Logs
- Service Logs
- FibroScan Module Logs

For a detailed list of Service Logs captured, see: 7-3-5 "Capturing Service Logs with ALT+D" on page 7-12.



R1.x.x and R2.x.x

R3.x.x or later

Figure 7-10 ALT+D Dialog Box

WARNING ***(R3.x.x or later) Check "Include Protected Information...." to save all log files.***

1.) When Alt+D is pressed, a menu box opens. Enter the following information:
   - System ID serial number.
   - Software version.
   - System Date and time of occurrence.
   - Sequence of events leading to issue.

7-3-4 Collecting a Screen Capture with Logs (cont'd)

- Is the issue repeatable?
- Imaging mode, probe, preset/application.
- Media brand, speed, capacity, type.
- Save secondary image capture, cine loop, 4D multi volume loop.

2.) Check System lockup/Include Protected Information.

3.) Select the Destination (storage media or *Service* directory for remote viewing through InSite) and click the Store button.

NOTE: Restart the application before resuming clinical scanning.

*NOTE: To save to a CD/DVD you **MUST** select CD/DVD Recordable as the destination device, otherwise the data is written to the default Export/Service directory on the hard drive. The Export/Service directory is only used for InSite. It is not intended for images or report storage use.*

For CD/DVD; the system will automatically format if you insert an unformatted disk, gather logs and write it out to the disk.

The subsequent file is compressed and time stamped. The screen capture is a bitmap which eliminates the possibility of artifacts from compression.

Double check the media that you made to ensure it contains at least two files as below example.

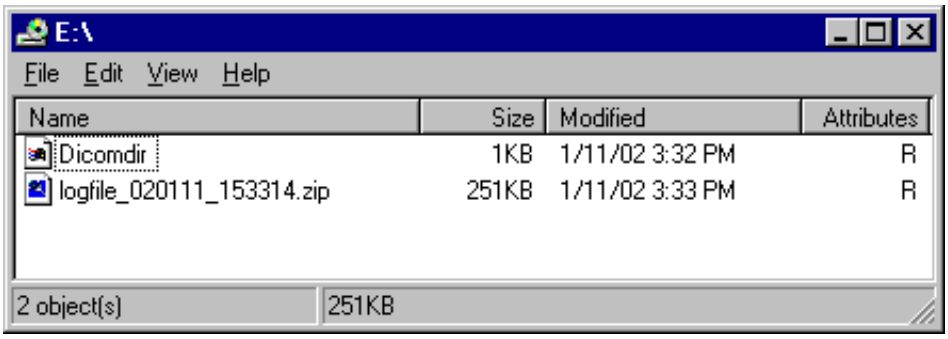


Figure 7-11 Example of Zipped Trouble Image & Logs File

NOTE: The name of the file includes the name of the system: log_93448US9_090910_101235.ziplog_computerName_YYMMDD_HHMMSS.zip.

In R3 and later, logs collected via Alt+D are divided in two groups, with and without patient information.

The Alt+D dialog box will request the user to check the box authorizing the inclusion of logs that could possibly include protected information.

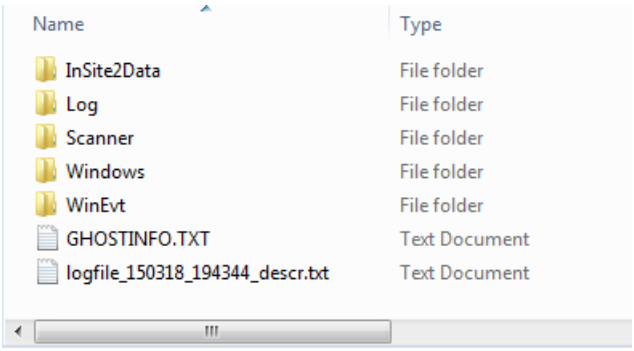
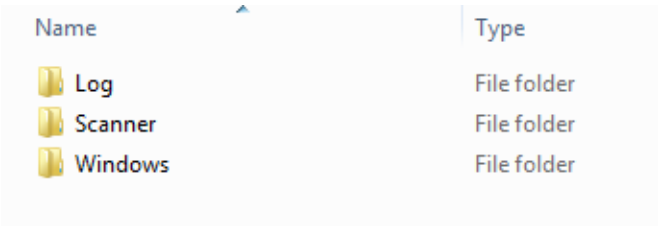
If box is checked, the system will create two log files with the following format name:

- log<SN>_<DATE>_<TIME>.zip
- log<SN>_<DATE>_<TIME>_ProtectedInfo.zip

NOTE: Where <SN> is the serial number, <DATE> is the date in format YYMMDD and <TIME> is the time in format HHMMSS.

7-3-4 Collecting a Screen Capture with Logs (cont'd)

R3.x.x or later: Zip file configuration

Zipped_log_without_protected_info.	Zipped_log_including_protected_info
	

7-3-4-1 Marking Log files

If a customer is experiencing issues during operations, the event can be marked and logged by pressing Alt+1 or Alt+2 when they occur. When Alt+1 or Alt+2 are pressed, the log will register time and help log analysis when troubleshooting intermittent issues.

7-3-5 Capturing Service Logs with ALT+D

The following is a list of the Service logs captured during an ALT+D log capture:

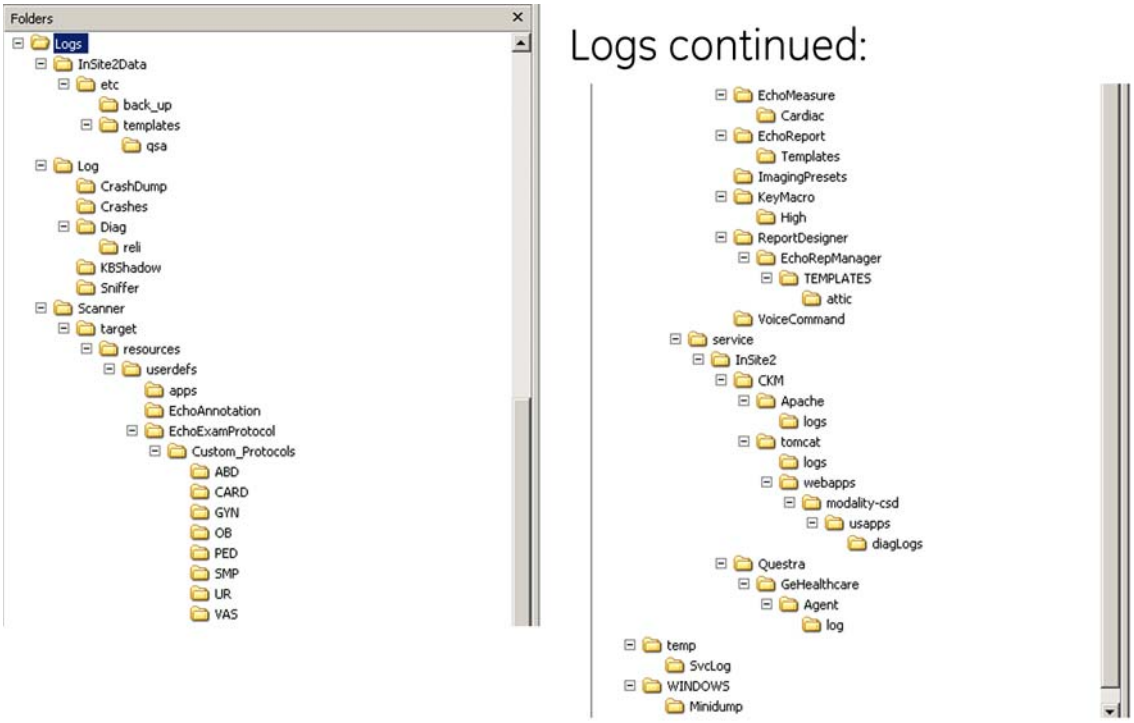


Figure 7-12 Log example

7-3-6 Screen captures

To capture screen images that can be used for diagnostic and troubleshooting purposes.

7-3-6-1 Ctrl+PrintScreen Shortcut

A Ctrl+PrintScreen shortcut is available for quickly capturing the image displayed on the system. Images captured using this shortcut are saved in the d:\export\service\image directory using both the JPEG (.jpg) and raw DICOM (.dcm) formats.

The InSite connection will have access to the export folder on the “D” drive to retrieve these images. This feature will allow the customer to quickly and easily acquire images that can then be viewed by the OLC.

7-3-6-2 To Capture a Screen Image Using the Shortcut

With the desired image displayed on the screen, press **Ctrl** and **PrtSc** (print screen) keys simultaneously.

If you want to compress or delete them:

1.) From the touchpanel, select Utility -> Service -> Utilities -> Common Utilities -> Image Compress & Delete Utilities.

2.) Select the checkbox for the image(s) you want to save, compress or delete.

3.) Select Compress or Delete Files, whatever function is desired.

A compressed file of the images is stored in d:\export. You may rely on the date and time of the Ctrl+PrtSc procedure to identify the most recent image recorded. The uncompressed files are stored in d:\export\service\image.

*NOTE: The Export\Service Directory may get deleted if the user clicks on the button **Delete Files For Transfer** on the **Save As dialog**. The Directory MUST BE recreated after it is removed.*

7-3-7 Capturing Network Logs with Network Sniffer

Logs collected should be stored under d:/log/Sniffer folder to ensure they form part of general log collection Alt+D or Collect Log.

1.) Press **Alt+N**.

2.) On the network sniffer screen, select **Capture** -> **Options**.

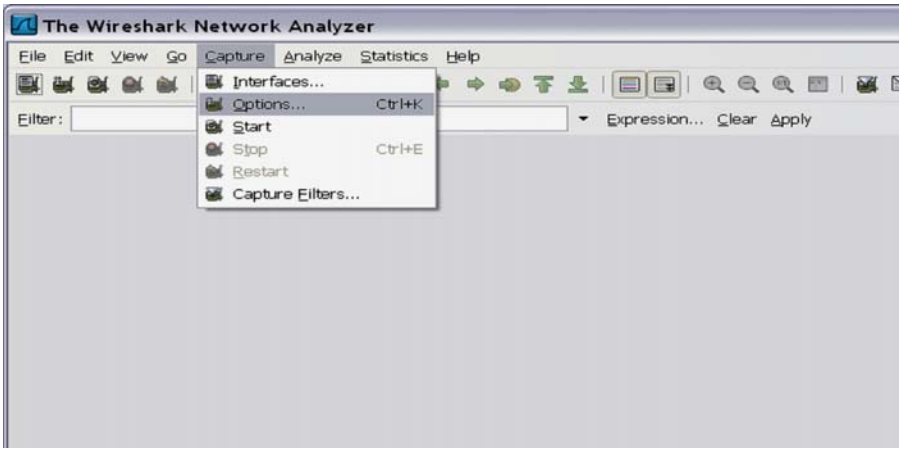


Figure 7-13 Network Sniffer Screen

Select the interface that will be receiving packets (Network card **A**).

NOTE: Remember, if the device has a DVR, it will show up in the list. Select either Intel Network connection or the Wireless network adapter.

7-3-7 Capturing Network Logs with Network Sniffer (cont'd)

Use filters to limit the captured data. Filter by IP or by IP and port number.

By IP only: press on Capture Filter.

3.) Select **IP only**.

Use the IP address of the system or the one from the DICOM device under test, on the Filter string field, using the following syntax: (example) host 3.62.12.33 as shown in below, press **OK**.

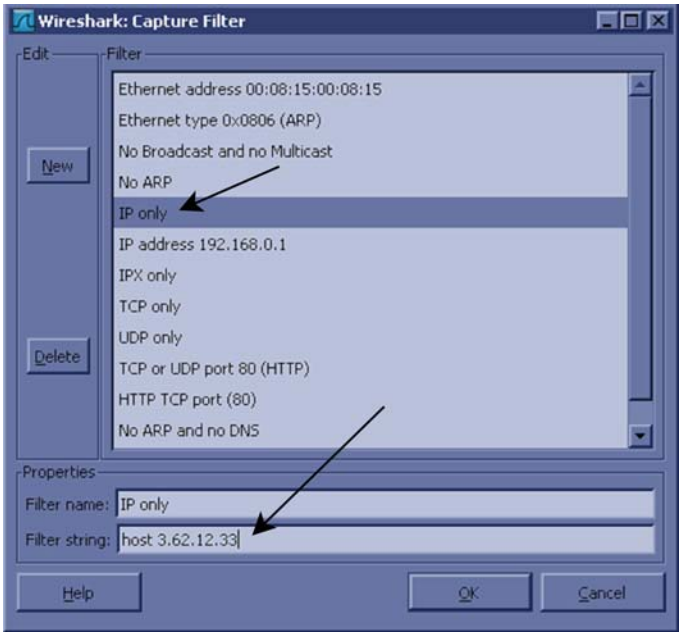


Figure 7-14 Capture Filter IP Only

7-3-7 Capturing Network Logs with Network Sniffer (cont'd)

By IP and port: Select Capture filter.

4.) Select **New**.

5.) Edit name for example DICOM port 104.

6.) Enter the string with the following syntax: port xxx and host yy.yy.yy.yy, where xxx is the port number of "My Computer" in the LOGIQ™ S8 and yy.yy.yy.yy is the IP address of the device under test (PACS, server, etc.).

7.) Press **OK**.

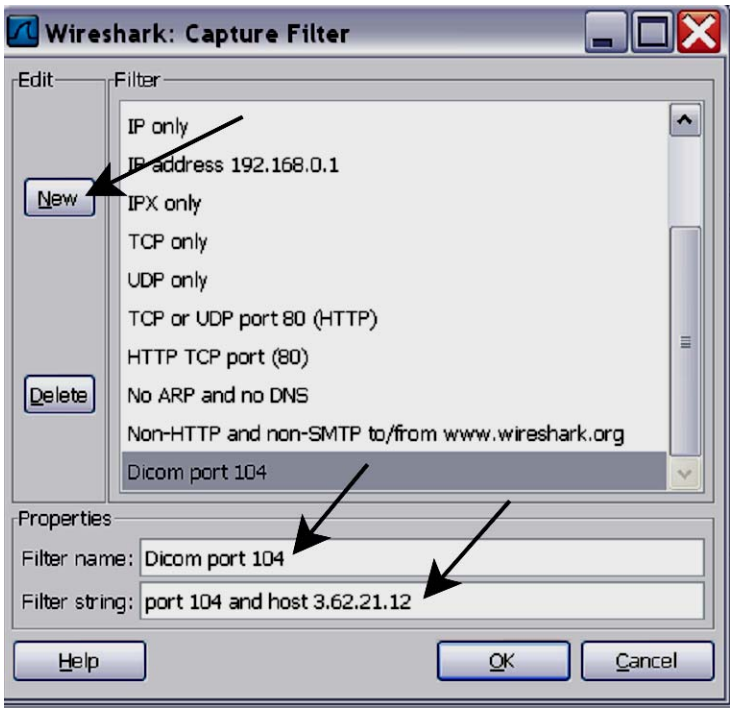


Figure 7-15 Sniffer Capture Filter IP and Port

8.) Select **Start**.

9.) Minimize network sniffer window and initiate communication to the DICOM device (e.g. send images to the storage device or query Worklist).

7-3-7 Capturing Network Logs with Network Sniffer (cont'd)

10.) Press Alt+N to restore Sniffer window and observe the network activity.

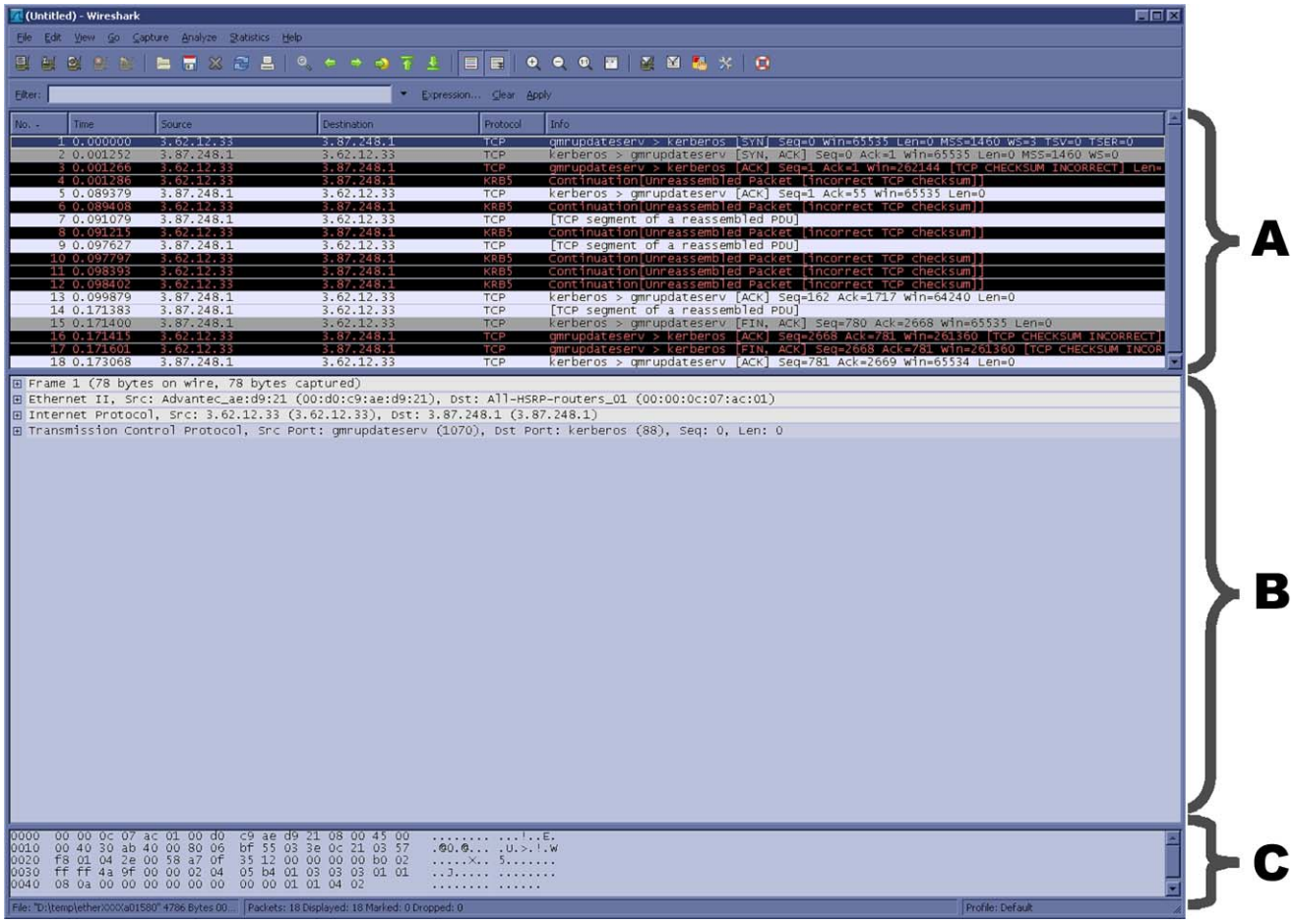


Figure 7-16 Sniffer Window and Network Activity

A.) "Packet List" pane - the packet list pane displays all the packets in the current capture file. Each line in the packet list corresponds to one packet in the capture file.

B.) "Packet Details" pane - shows the current packet (selected in the "Packet List" pane) in a more detailed form. This pane shows the protocols and protocol fields of the packet selected in the "Packet List" pane.

C.) "Packet Bytes" pane - The packet bytes pane shows the data of the current packet (selected in the "Packet List" pane) in a hexdump style.

7-3-7 Capturing Network Logs with Network Sniffer (cont'd)

In addition to the pre capture filter, use the Filter tool on the screen to filter what is displayed.

Filter the DICOM packets, since they are the most probable for the troubleshooting.

11.) Type "dcm" and press **Apply**. The display should filter all DICOM packets, filtering out image data.

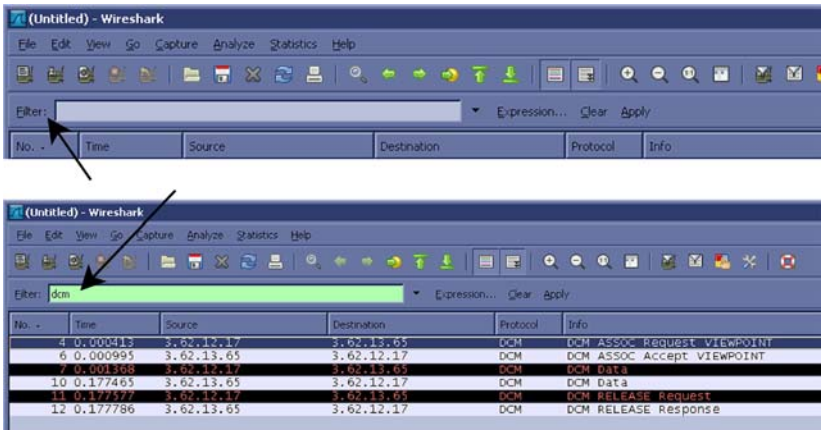


Figure 7-17 Filter Tool Display

12.) Select Capture > Stop. Or, select the icon in the task bar to stop the capture.

13.) Select File > Save As. Enter the file name d:\log\Sniffer\MyLog. (MyLog can be changed to the name of your preference).

WireShark uses the libpcap (*.pcap, *.cap) file format as the default format to save captured packets. (If you need to open this file with D-Trace or DVTK, the capture can be reserved in NA Sniffer Windows format).

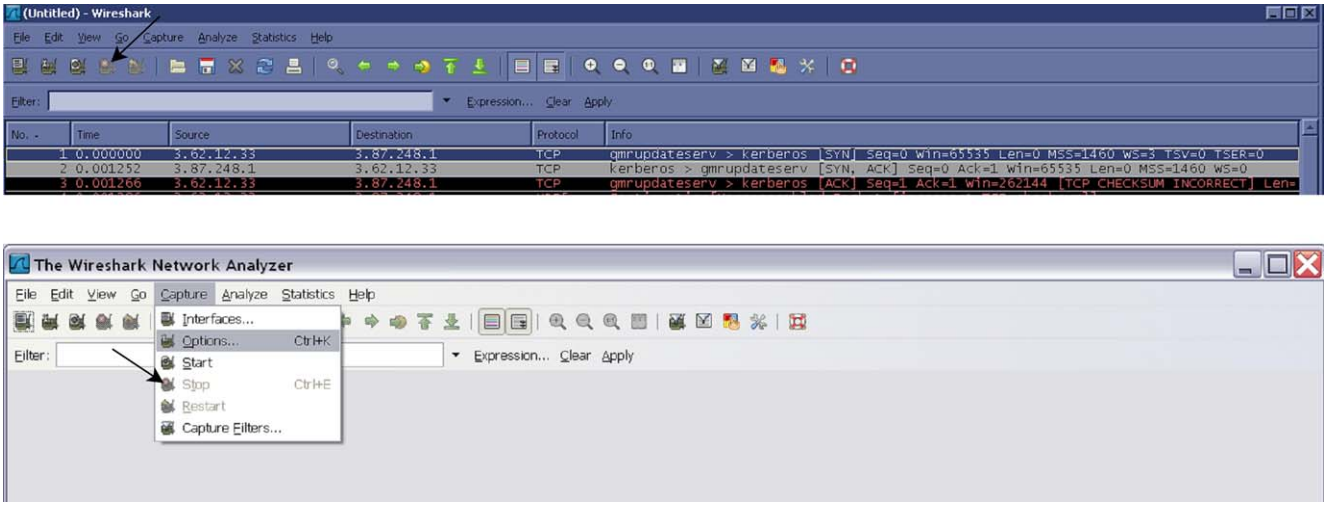


Figure 7-18 Select Capture Stop Icon

7-3-7 Capturing Network Logs with Network Sniffer (cont'd)

14.) Select Displayed. This will save only the filtered values rather than the entire capture.

15.) Select **SAVE**.

If you perform Alt+D or Gather Logs, these sniffer logs will be included in the zip file.

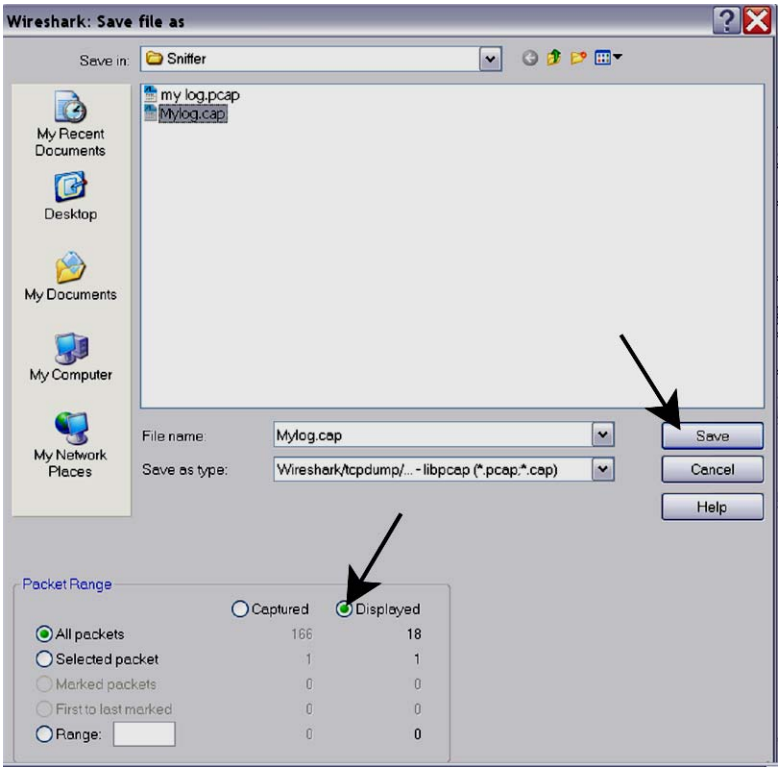


Figure 7-19 Select Capture Display

16.) Exit the sniffer application by clicking on the X in the upper right corner.

17.) If you have already performed Save as, you can continue without saving and quit the program. Make sure you have saved your data before exiting the program.

Figure 7-20 Save Capture Data Question

Section 7-4
Service Desktop (CSD) - R1 to R4

7-4-1 Purpose of this Section

This section describes the features of the Common Service Desktop (CSD).

NOTE: To run diagnostics, you should detach all probes.

NOTE: Reboot the system after performing any diagnostics before returning the system to customer use.

*NOTE: When using the Common Service Desktop do **NOT** minimize any of the Common Service Desktop windows. If you minimize them they end up in the lower left corner of the screen behind the Service Desktop Manager window and cannot be restored.*

7-4-2 Contents in this chapter

7-4-3 Global Service User Interface (GSUI)

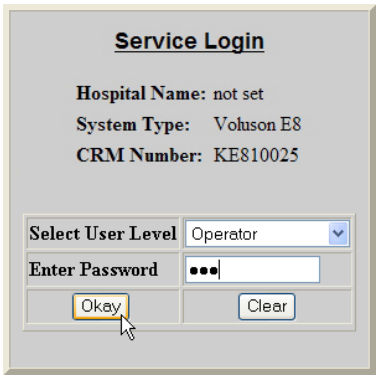
Internationalization

The user interface provided by the service platform is designed for GE personnel and is in English only. There is no multi-lingual capability built into the Service Interface.

Service Login

1.) Local Access (R1 to R4) via Utility - Service.

2.) Service Login screen is displayed.



3.) As soon as the Common Service Desktop (CSD) is started, the Service **[Home]** Page appears

Access / Security

The service interface has different access and security user levels. Each user is only granted access to the tools that are authorized for their use.

Table 7-1 Access Authorization

USER LEVEL	ACCESS AUTHORIZATION	PASSWORD
Operator	Authorized access to specified diagnostics, error logs and utilities. Same acquisition diagnostic tests as GE Service.	uls
Administrator		uls
External Service		gogems
GE Service	Knowledge of the service level password.	rotating security password

Every access request, whether successful or not, will be logged into a service access log that is viewable to authorized users.

Restart LOGIQ S8 after diagnostics

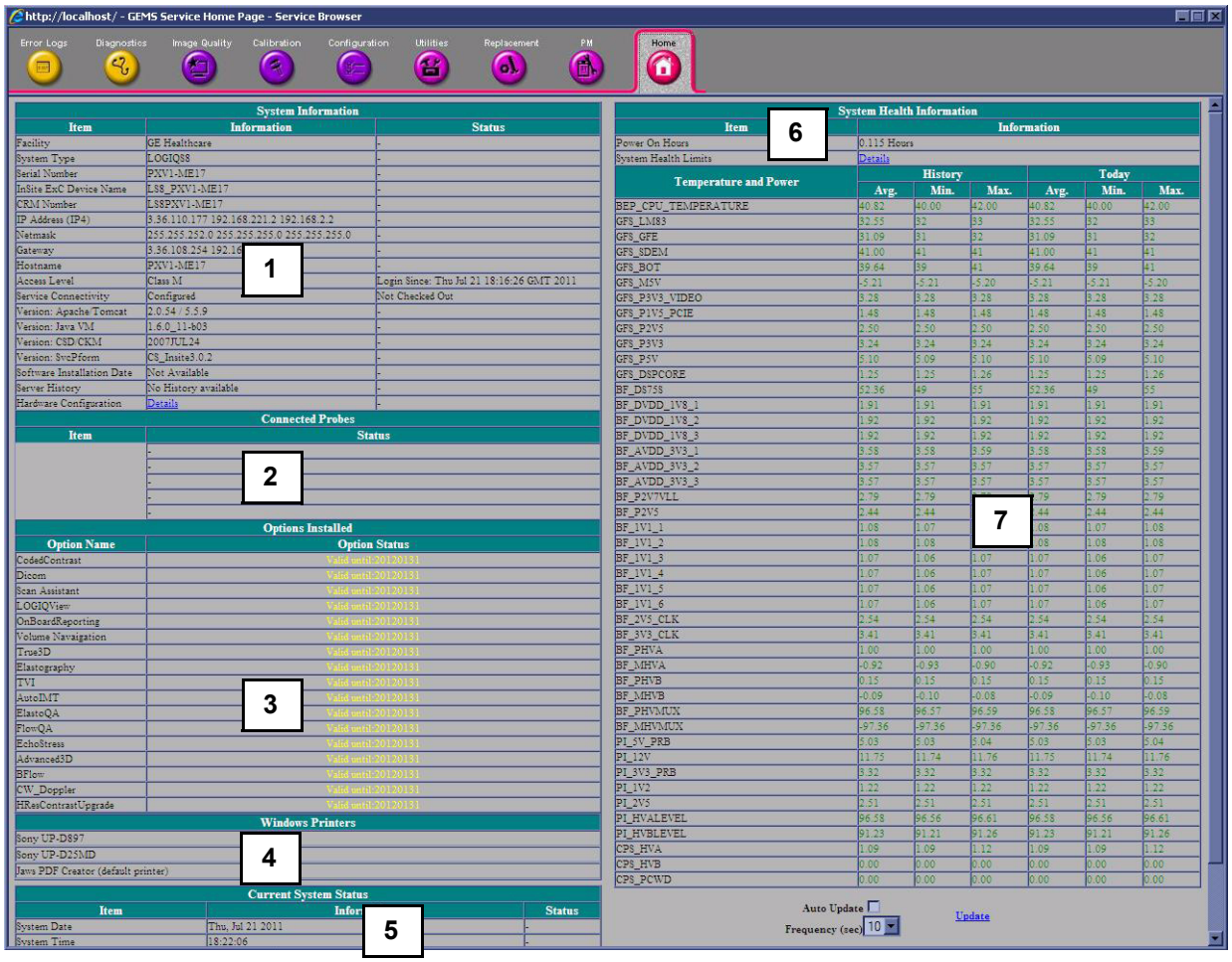
Always shutdown the system and reboot after a diagnostics session. A red message on the task bar will remind you that the system needs to be restarted after a diagnostic run or disruptive mode is enabled, before it is returned for customer use.

7-4-4 CSD Top Page

7-4-4-1 General Layout

Table 7-2 CSD Home Page

1	System Information		System ID, Serial, IP Address, InSite Status, etc.
2	Connected Probes		Connected and System recognized probe listed
3	Options Installed		Enabled Options and its expiration date
4	Windows Printers		Connected and system recognized peripheral listed
5	Current System Status		System Date, Time...etc
6	System Health Information	Current System Status	System Power ON hours. Health Limit link should not be referenced.
7		Temperature and Voltage	Details on the following section



7-4-5 Error Logs

When the **Error Logs** page is selected, different log viewing options are available. Log Viewer is displayed in a separate window.

Figure 7-21 Common Service Desktop - Error Logs

7-4-5-1 Log Viewer

When the **Log Viewer** option is selected in the left pane of the *Error Logs* page. It is driven by the following high-level requirements:

- Simple filtering of the scanner log(s) with filtering capabilities as a function of login access permissions.
- Log visibility by all services modes.
- Multiple instances of the log viewer.
- Color-coded log entries for severity levels, as follows:
  - Severity 1 - Green
  - Severity 2 - Yellow
  - Severity 3 - Red
- Support the transfer of logs to local or remote destinations.

Following categories are displayed. Each enables to view a number of different system logs.

Figure 7-22 Log Viewer Menu Options

1.) **LOGS** - enables to view following logs:
   • System: Displays all the system logs, including errors and additional details
   • Power: Displays all the power logs, including errors, monitoring dates and values
   • Temperature: Displays all the temperature logs, including errors, monitoring dates and values
2.) **UTILITIES** - enables to access following log utilities:
   • Plot Log: to view the results of the Temperature or Power logs in graphical format.
   • Plot Page: to view the results of the System log in graphical format, showing distribution of log information according to packages.
3.) **SEARCH** - enables to enter case-sensitive text to be filtered from logs or pages currently viewing
4.) **FILTER** - available to users with the GE Service access level. Select the System Logs option to select default options to be filtered from the System Logs.
5.) **EXIT** - Select “Exit Log Viewer” to return to the Common Service Desktop.

7-4-6 Diagnostics

The **Diagnostic** page uses a web-controlled user interface to provide access to common service components and perform diagnostics.

- **Non-Interactive:** The tests are performed without the user's intervention.
- **Interactive:** The user is required to perform an operation on the ultrasound unit in order for the test to be completed successfully. This option is not applicable when used remotely.

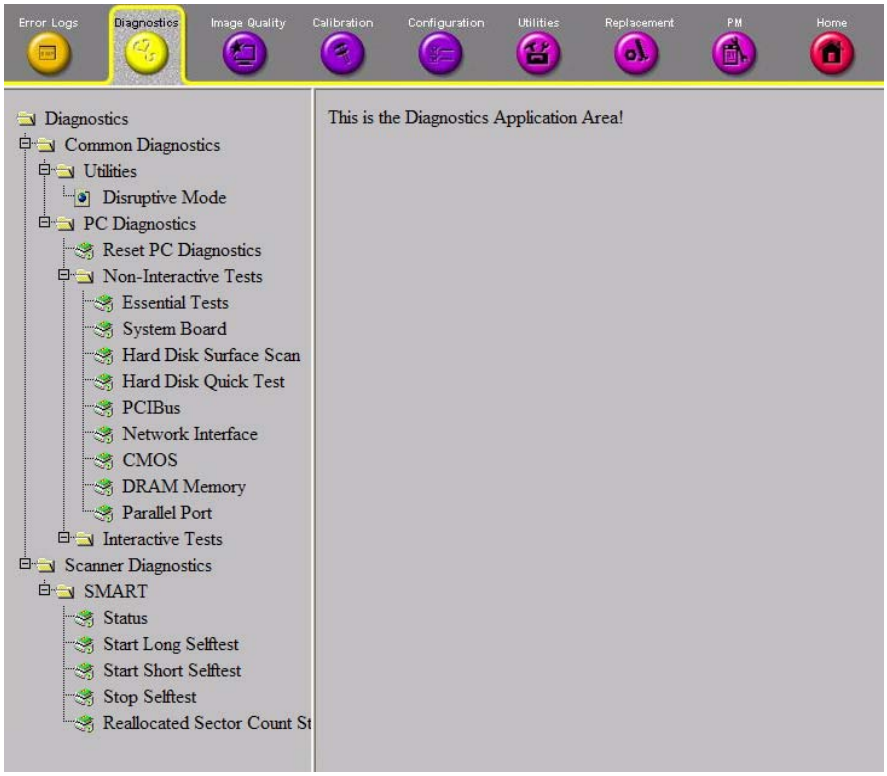


Figure 7-23 Common Service Desktop - Diagnostics

7-4-7 Image Quality

In the **Image Quality** page, you can verify image quality.

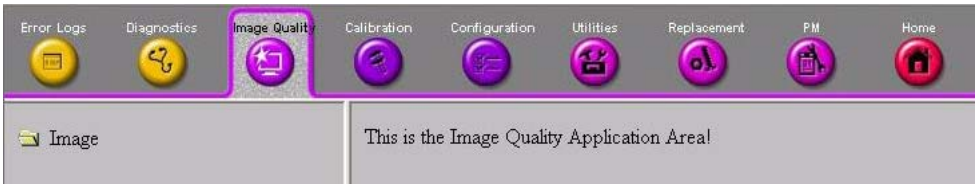


Figure 7-24 Common Service Desktop - Image Quality

NOTE: This **page is not populated** in this version.

7-4-8 Calibration

There is no accessible parameters from Calibration.

7-4-9 Configuration

In the **Configuration** page, you can view and modify different device informations and configurations. in the “InsiteExC Agent Configuration” option field.

Figure 7-25 Common Service Desktop - Configuration

NOTICE Remote access is **ONLY possible if the service platform is properly configured** (either by the user or a GE technician at site).

7-4-10 Utilities - Common Utilities

7-4-10-1 Event Log Viewer

1.) Select the log you wish to view:

- Application link = an event log relative to application events
- System link = an event log relative to system events
- Log Name = enter the Log Name you want to view and click the View button

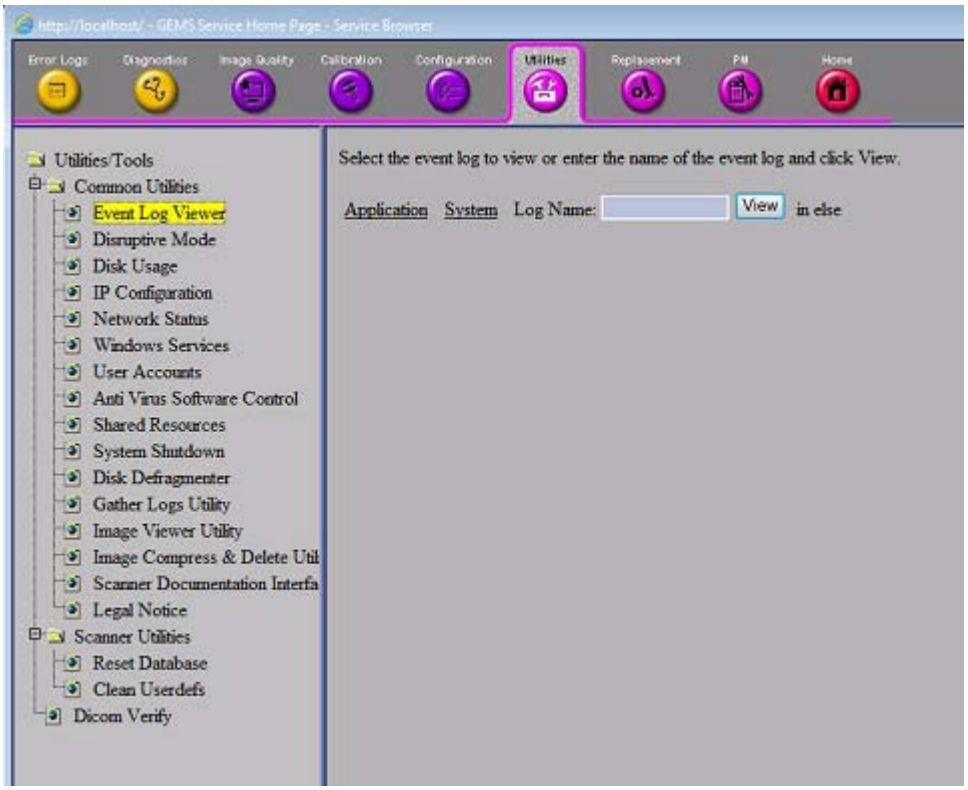


Figure 7-26 Event Log Viewer Window

7-4-10-2 Disruptive Mode

Allows you to enable or disable disruptive mode troubleshooting. If you are accessing through InSite, this can only be enabled with the customer/operator confirmation.

Figure 7-27 Disruptive Mode Window

7-4-10-3 Disk Usage

View capacity and usage statistics for the different disk drives.

Figure 7-28 Disk Usage Window

7-4-10-4 IP Configuration

View Windows IP configuration and LAN connection data.

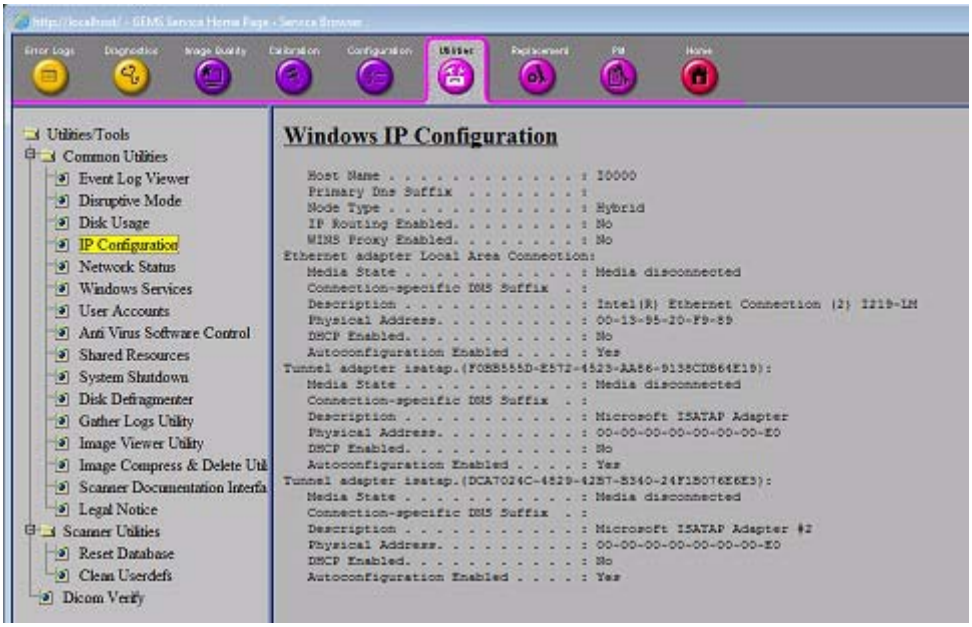


Figure 7-29 IP Configuration

7-4-10-5 Network Status

View data for active network connections.

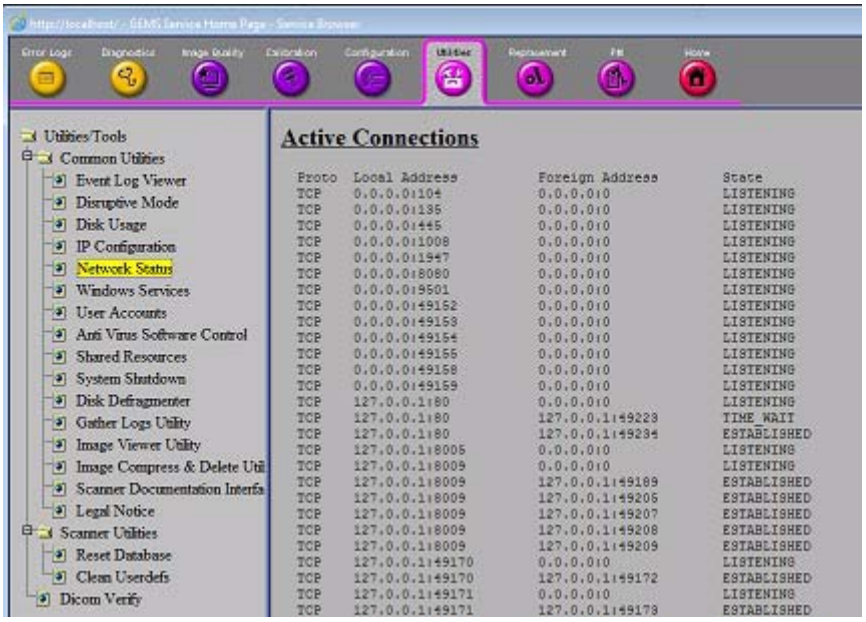


Figure 7-30 Network Status Window

7-4-10-6 Windows Services

View the Windows Services that are started and running. A Windows Service is a computer program that has been automatically started and is running in the background on the computer.

Figure 7-31 Windows Services Window

7-4-10-7 User Accounts

View the user accounts that have been given access to this system.

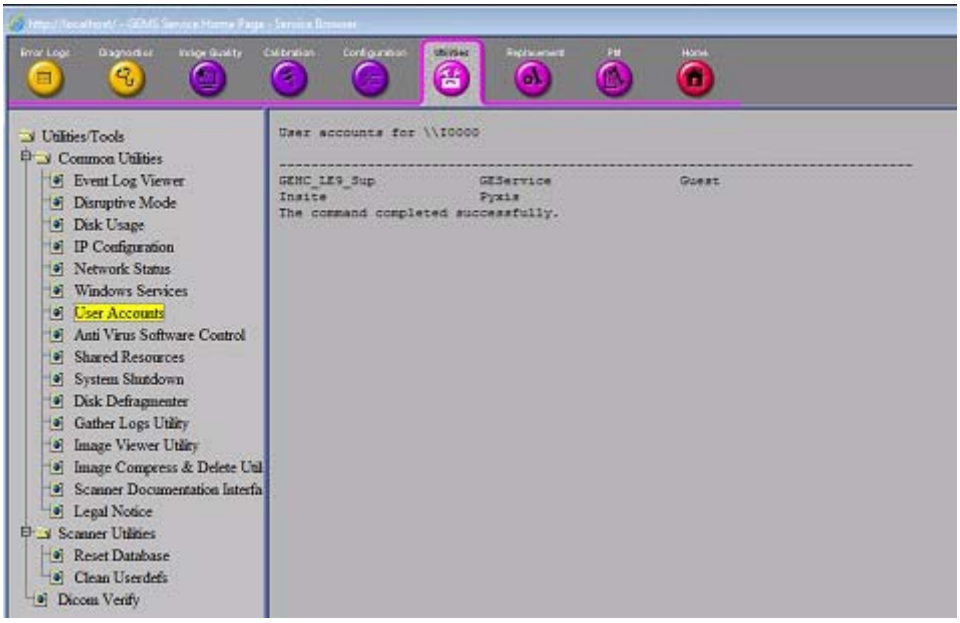


Figure 7-32 User Accounts Window

7-4-10-8 Anti Virus Software Control

Select [Disable] to disable the Anti-Virus software if needed.

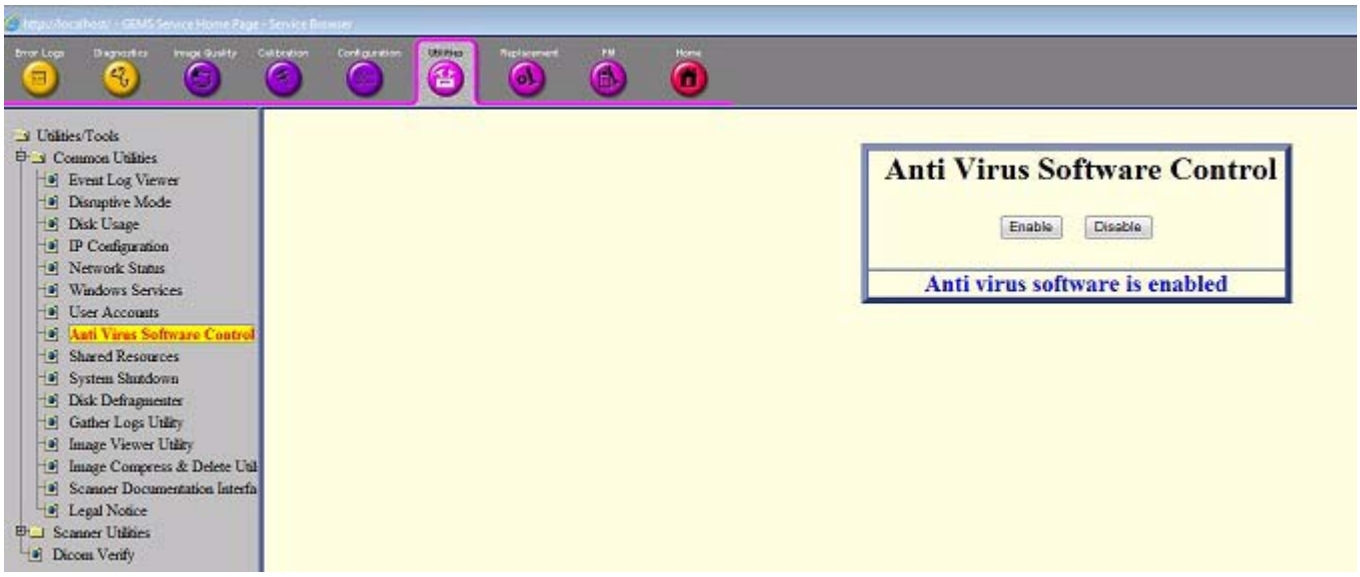
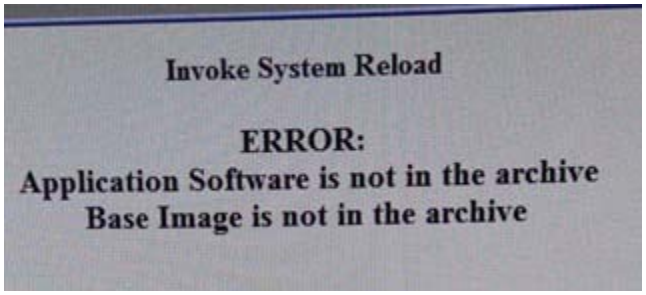


Figure 7-33 Anti Virus Software Control Window

NOTE: (R4) If the "Advanced Security" software option installed, and the Anti-Virus software has not been disabled, the following message appears. Disable the Anti-Virus software by following the steps above.



7-4-10-9 Shared Resources

This screen displays all shared network resources on this system.

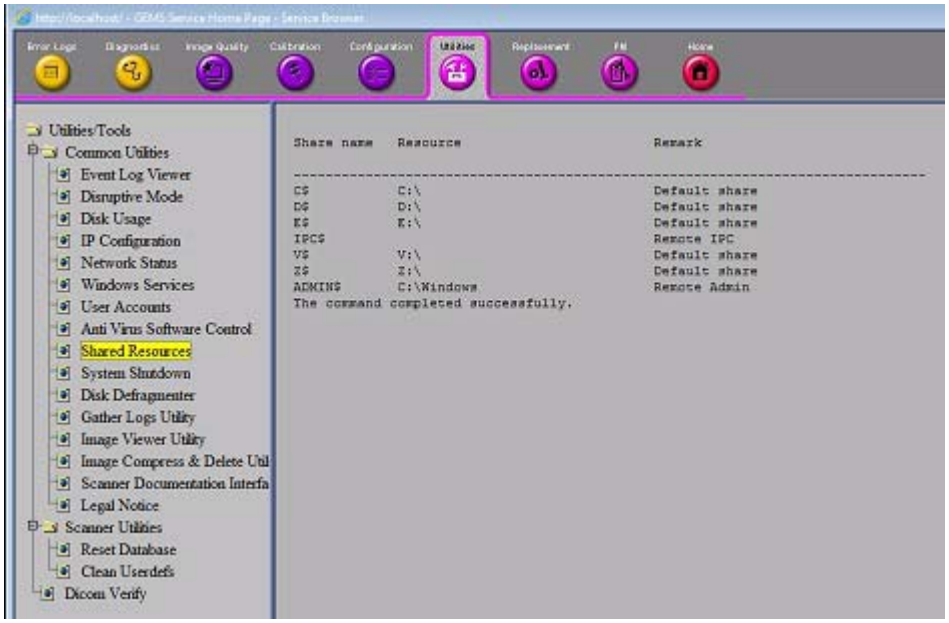


Figure 7-34 Shared Resources Window

7-4-10-10 System Shutdown

System Shutdown gives you the ability to Restart or Shutdown the system when using Virtual Console Observation from a remote computer.

NOTE: Retain Disruptive Mode checkbox:

- MUST be checked if you are working from a remote computer.
- Should be unchecked if you are working locally on the scanner.

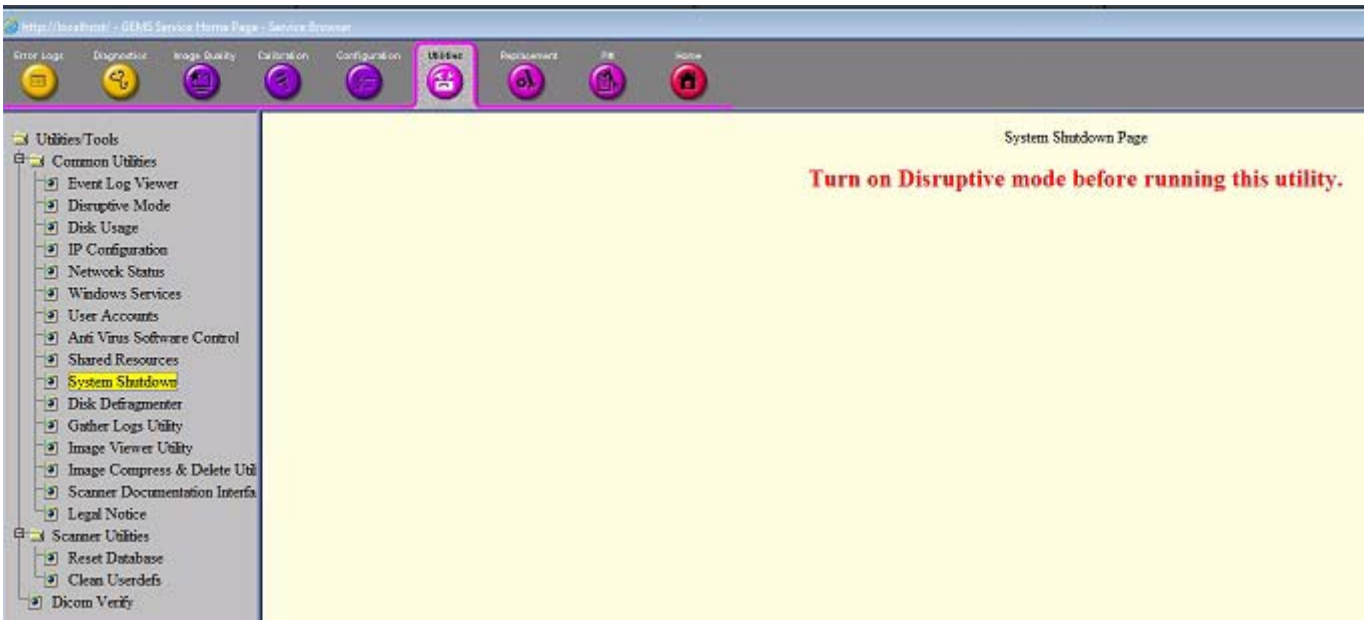


Figure 7-35 System Shutdown Window

7-4-10-11 Gather Logs Utility

Click the Gather Logs button to prepare them for retrieval by the On Line Center. The logs are compressed into a .zip file and the file path and file name is displayed on the window.

If the application is not running, logs can be gathered using the Gather Logs shortcut on the Windows desk top.

Figure 7-36 Gather Logs Utility WIndow

In R4 and later, Gather Logs Utility will not be collecting logs that contain protected information. If those logs are needed, the OnLine Engineer will have to request the user to perform an Alt D function, authorizing the inclusion of protected information in the logs.

7-4-10-12 Image Viewer Utility

The Image Viewer Utility lists the availability of images for export. This example shows no images available for export.

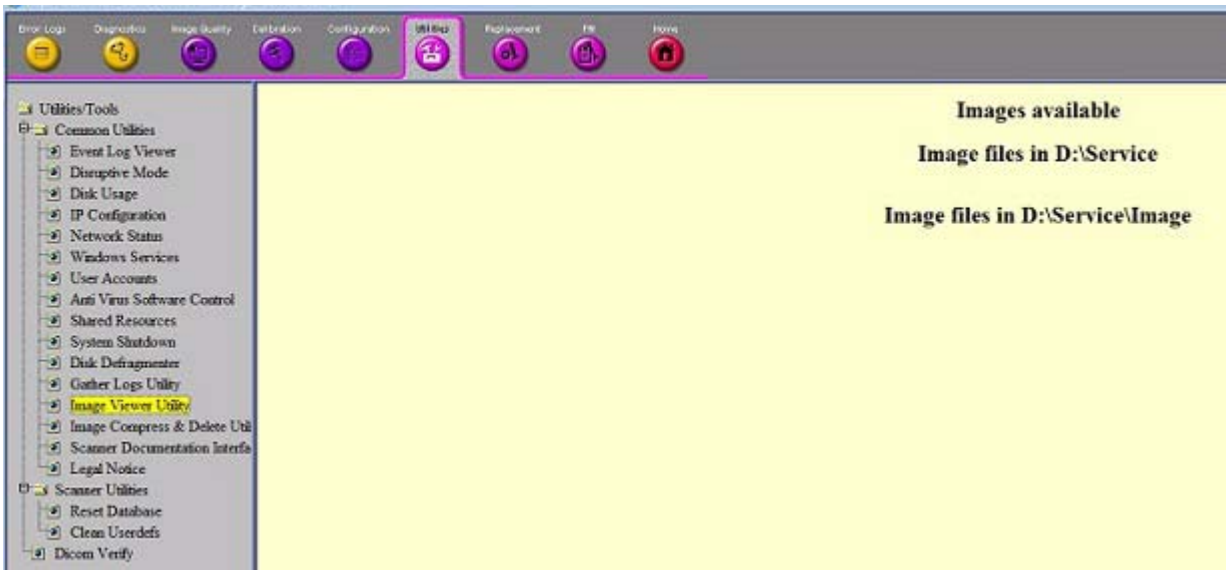


Figure 7-37 Image Viewer Utility Window

7-4-10-13 Image Compress & Delete Utility

Select the images you want to compress or delete. This example shows no images available at this time.

- Compress Files = compresses images into a .zip file.
- Delete Files = deletes the images from the image Export/Service directory.

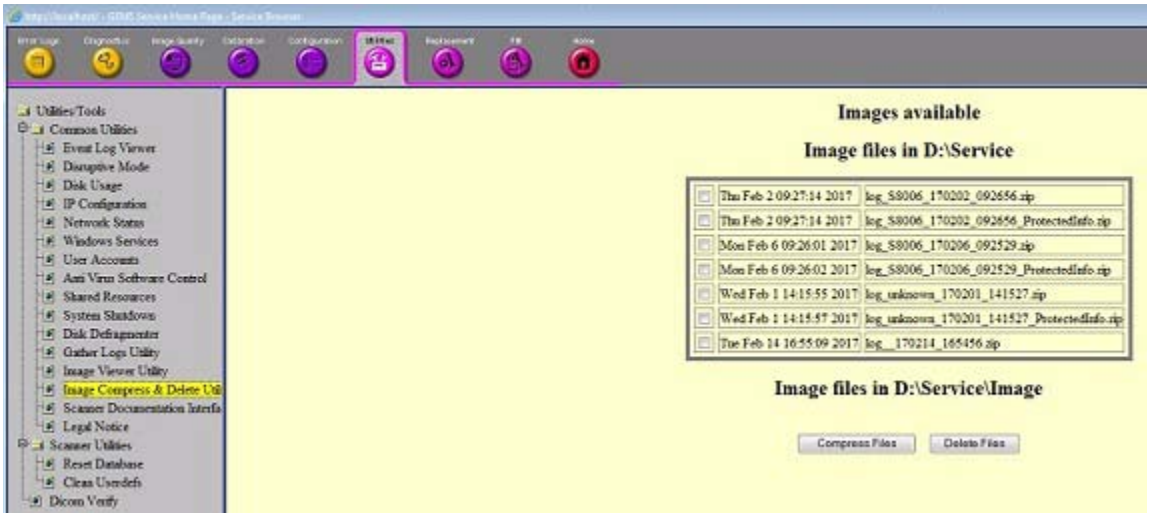


Figure 7-38 Image Compress & Delete Utility Window

7-4-10-14 Scanner Documentation Interface

Use this to view the user and service documentation for the system. You need to have eDoc CD inserted in the drive in order to open it.

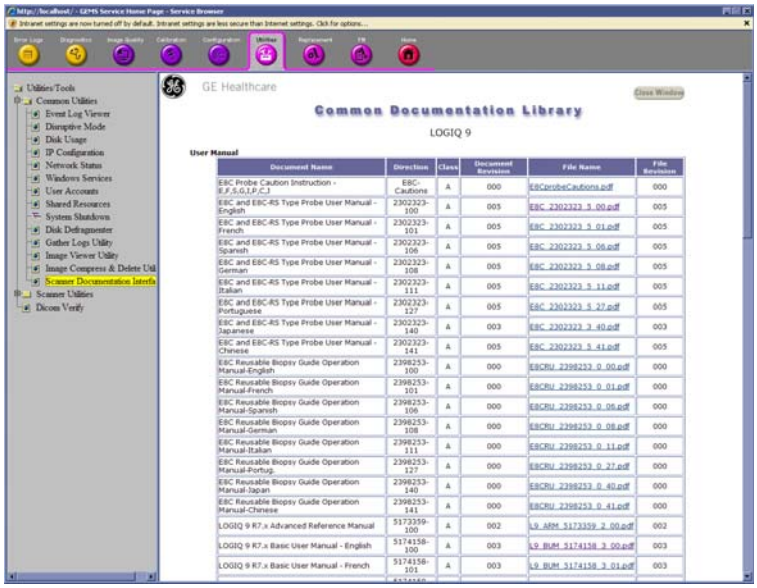


Figure 7-39 Scanner Utilities Window with eDoc CD

7-4-11 Utilities - Scanner Utilities

7-4-11-1 Reset Database

Remove Patient data from database.

Figure 7-40

7-4-11-2 Clean Userdefs

Remove User defs under D:\scanner\target\resources.

Figure 7-41 Clean Userdefs

7-4-11-3 DICOM Verify

This utility provides an easy way to verify DICOM connectivity between the scanner and DICOM devices on the network.

1.) Enter AE Title, IP Address, and Port values of the DICOM device.

2.) Check the Loop checkbox to repeat the operation, or leave it unchecked to perform the operation once.

3.) Click the Verify button to see the results.

4.) Uncheck the Loop checkbox to stop the operation.

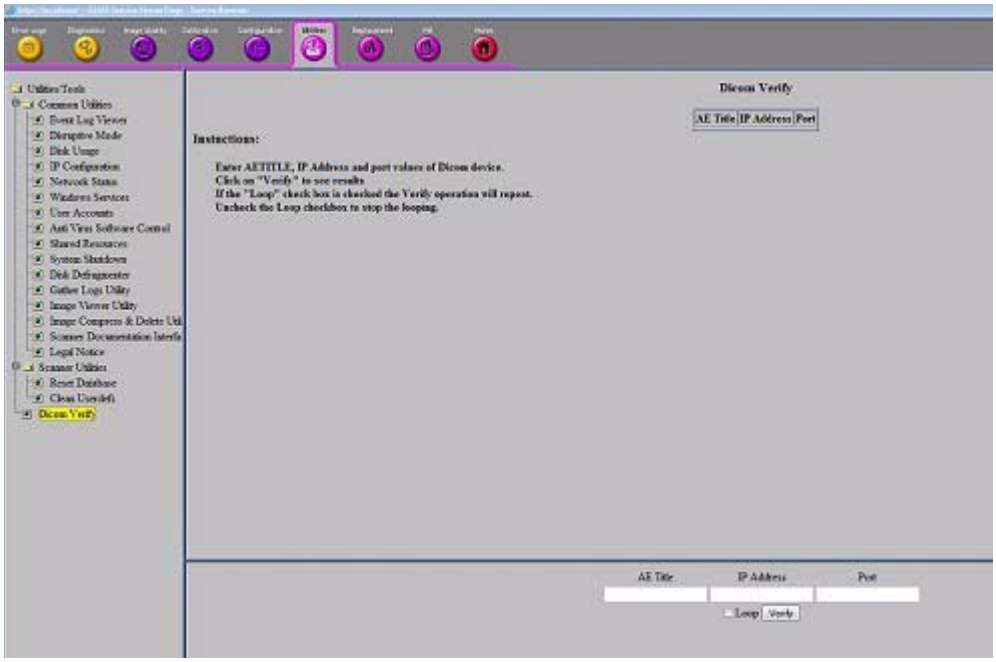


Figure 7-42 DICOM Verify Window

7-4-12 Replacement

Field is not populated.

7-4-13 PM

Field is not populated.

Figure 7-43 Common Service Desktop - PM

Section 7-5
Gathering Troubleshooting Data (R4.2.5x and later)

7-5-1 Purpose of this section

Problem images and system data (logs) can be acquired at the LOGIQ™ S8 or through service remote connectivity. Use this data to perform service at the LOGIQ™ S8 or to send it back to the manufacturer for analysis.

NOTE: Login before gathering log files.

To gather log files, the system requires a user to be logged in. The error message below appears when hitting Alt+D key without any user logged in.

7-5-2 Collecting vital system information

The following information is necessary to properly analyze data or images being reported as a malfunction or a LOGIQ™ S8 being returned to the manufacturer:

NOTE:This information is normally collected with Alt+D or Gather Logs.

Product Name = LOGIQ™ S8

Navigate to **Utility** > **System** > **About**.

Under **Software**, record:

- Software Version
- Software Revision
- Software Part Number
- Build Name
- Build View
- Build Date

Under **System Image**, record:

- Image Part Number
- Image Date

7-5-3 Shortcut keys

There are several shortcut keys on the LOGIQ™ S8 that can be useful during troubleshooting:

Table 7-3 Shortcut Keys

Key	Description
Alt+1 or **Alt+2**	Marks events in the log file. Used for the flagging issues during operation.
Alt+F10	Displays SW Shut Down. If the LOGIQ™ S8 can be shut-down by using these keys, it means that SW is working and the problem could be the ON/OFF switch or the wire that carries the shut-down signal.
Alt+F5	For the echo simulator (keyboard simulation), brings up or removes the front panel simulator. It may be used with VCO to press buttons on the front panel that are not standard keys on your PC. .
F4	Displays the DICOM Job Spooler.
Alt+A	Displays a cursor (Alt+A stands for arrow).
Alt+D	Captures scanner logs.

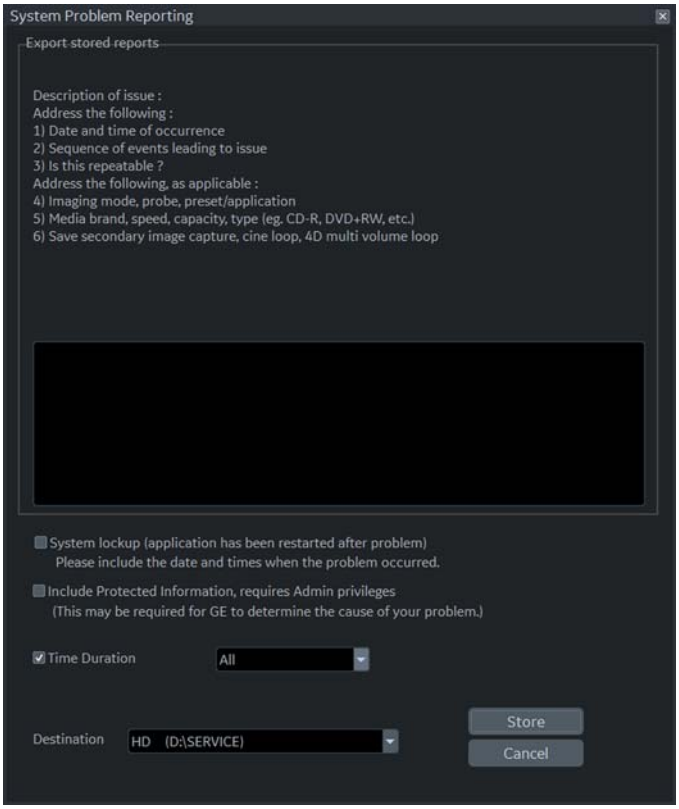
7-5-4 Collecting a screen capture with logs

If the LOGIQ™ S8 malfunctions, simultaneously press the **Alt+D** keys. Alt+D is available at all times and collects a screen capture of the image monitor, user-defined presets, and these logs:

- Keyboard Shadow Log (protected information)
- Error Logs
- Crash Log (protected information)
- Vital Product Data
- DICOM Logs
- Windows Event Logs
- Windows Modem Log
- Diagnostic Logs
- Service Logs

For a detailed list of Service Logs captured,
see 7-3-7 "Capturing Network Logs with Network Sniffer" on page 7-14.

Figure 7-44 ALT+D Dialog Box



7-5-4 Collecting a screen capture with logs (cont'd)

To collect a screen capture with logs:

1.) Press **Alt+D**. The System Problem Reporting dialog box opens.

2.) Enter the following information:

- System ID serial number
- Software version
- System date and time of occurrence
- Sequence of events leading to issue
- Whether the issue is repeatable
- Imaging mode, probe, preset/application
- Media brand, speed, capacity, and type

3.) To authorize the collection of protected information, check **Include Protected Information, requires Admin privileges**. If this box is checked, the system creates two log files with the following format name:

- log_<SN>_<DATE>_<TIME>_DB.zip
- log_<SN>_<DATE>_<TIME>_ProtectedInfo_DB.zip

Where <SN> is the serial number, <DATE> is the date in format YYMMDD and <TIME> is the time in format HHMMSS.

4.) To include a duration, check **Time Duration** and select a duration from the dropdown.

5.) Under **Destination**, select a storage media or *Service* directory for remote viewing.

6.) Click the **Store** button.

*NOTE: To save to a CD/DVD or USB Flash Drive, you **MUST** select CD/DVD Recordable or USB drive as the destination device, otherwise the data is written to the default Export/Service directory on the hard drive. The Export/Service directory is only used for remote service and is not intended for images or report storage use.*

For a CD/DVD, the LOGIQ™ S8 automatically formats an unformatted disk, gathers logs and writes it out to the disk.

The subsequent file is compressed and time stamped. The screen capture is a bitmap which eliminates the possibility of artifacts from compression.

7-5-4 Collecting a screen capture with logs (cont'd)

Double check the media that you made to ensure it contains the file. An example is shown in *Figure 7-45 "Example of Zipped Trouble Image and Logs File" on page 7-42*.

Figure 7-45 Example of Zipped Trouble Image and Logs File

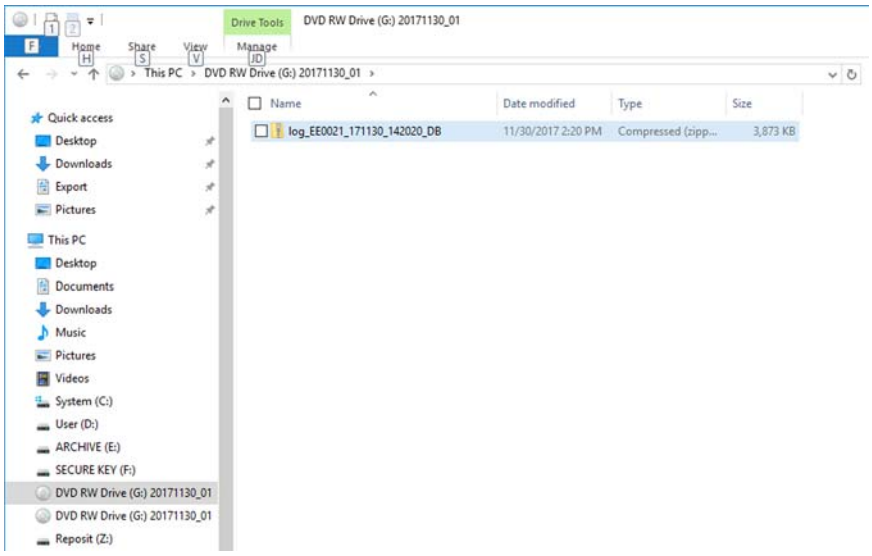
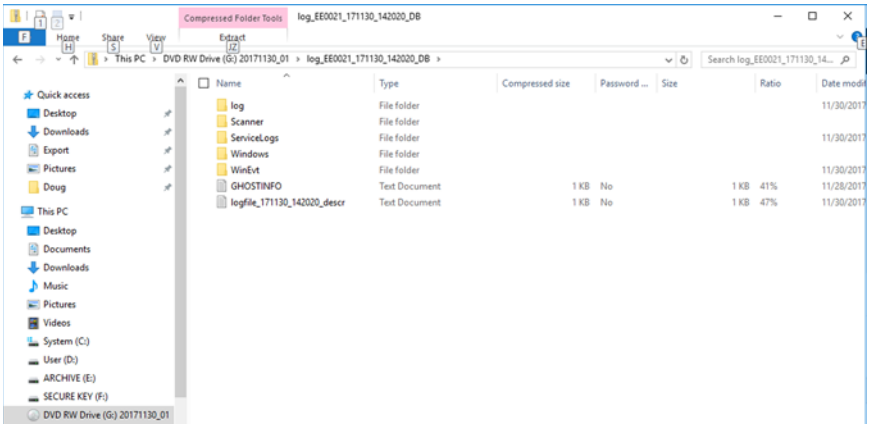


Figure 7-46 Contents of the Zipped Trouble Image and Logs File



Mark log files

If a customer is experiencing issues during operation, mark the issue by pressing **Alt+1** or **Alt+2** when the event occurs. When **Alt+1** or **Alt+2** is pressed, a marker is placed in the log to aid analysis.

7-5-4 Collecting a screen capture with logs (cont'd)

Trouble image without patient information

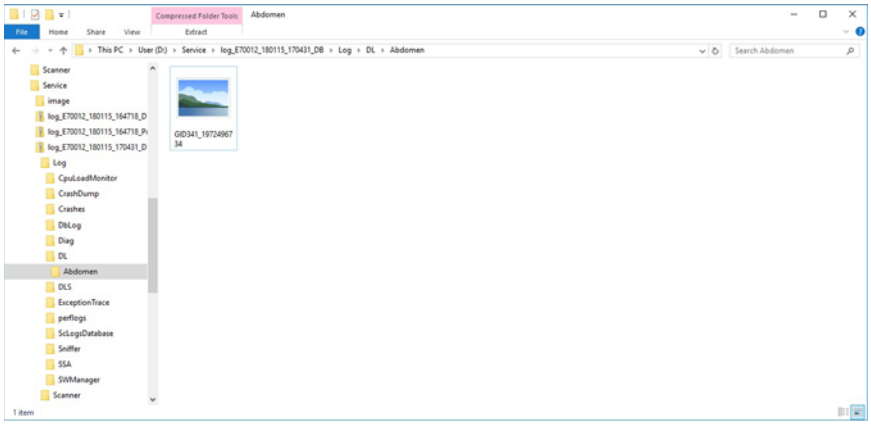
To collect a trouble image you need to enable **Transfer Images** (captured without patient information) to GE under **ADMIN > System Admin**.

To collect the image, press the **P1** key (copy to hard drive). This places an unidentified .jpeg image in the D:\Log \DL folder. This folder will be transferred to the back office if a transfer is scheduled.

Figure 7-47 Example of a Trouble Image Collected with P1

To collect logs using **Gather Logs**, the image or images will be captured in the log collection Zip file and will be deleted from the D:\Log \DL folder.

Figure 7-48 Example of a Trouble Image Collected with Gather Logs



7-5-5 Capturing network logs to use for troubleshooting

Use the **Network Capture** utility to capture network logs. Once the logs are captured and extracted from the system, use Microsoft Message Analyzer to convert the output, and then Wireshark (or some other network sniffer) to analyze it.

To troubleshoot network capture logs:

1.) On the LOGIQ™ S8, run the **Network Capture** utility to generate .etl and .cab files for analysis. For more information, see "Network Capture" on page 7-61.

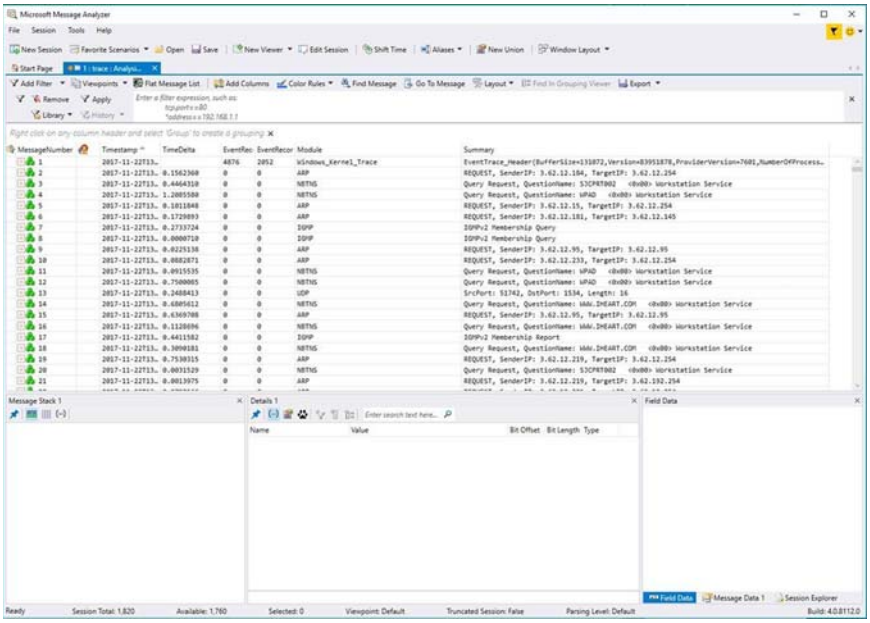
2.) Locate the .etl file at D:\Service.

3.) Transfer these files to a laptop.

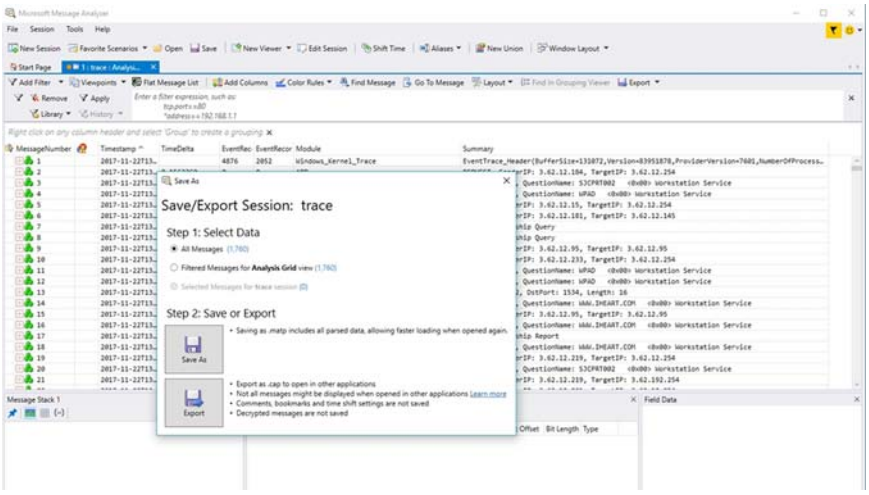
4.) On the laptop, download Microsoft Message Analyzer (if not already done).

5.) In Microsoft Message Analyzer, open the .etl file.

If the DICOM connection is encrypted, you will not be able to see the contents of the packets. Microsoft Message Analyzer does not have a plug-in to decode DICOM packets.



6.) To export the .etl file to .cab, select **File > Save As** and then select **Save As** or **Export**.



If the network capture was of a wireless connection, Microsoft Message Analyzer creates a .pcap file that does not have any of the packets and is probably useless.

7.) Use Wireshark or some other third-party network sniffer to examine the .cab file.

Section 7-6
Service Desktop (R4.2.5x and later)

Contents in this section

7-6-1 Purpose of this section

This section describes the features of the Service desktop. These are the different levels of access to the Service desktop:

- Service Basic access (Class A) – a user locally logged into the machine with Local Service Access privilege. This level provides limited access to Service desktop widgets and utilities.
- Remote access – a user remotely accessing the LOGIQ™ S8. This level provides unrestricted access to all Service desktop widgets and utilities. Disruptive mode is limited to the user access privileges to Remote Service Access.

7-6-2 Disruptive mode

Disruptive mode is a way to control interruptions to operation of the LOGIQ™ S8. Disruptive mode is required whenever service performs a function that may disrupt a normal scan. Activating Disruptive mode results in a red message displayed on the task bar. This message indicates that the LOGIQ™ S8 needs to be restarted once the service activity is complete. The message remains until the LOGIQ™ S8 is restarted. This prevents patient scanning while the LOGIQ™ S8 is not operating at an optimal status. For example, running a diagnostic may leave the LOGIQ™ S8 in a state that is not good for imaging.

Specifically, Disruptive mode is required to run diagnostics, clean presets, and reset the patient database, and turn on Virtual Console Observation (VCO).

- When Disruptive mode is On, all service functionality on the Service desktop is allowed but user operation of the LOGIQ™ S8 may be limited.
- When Disruptive mode is Off, some service functionality on the Service desktop is not available and user operation of the LOGIQ™ S8 is normal.

Additionally, the ability to enable Disruptive mode depends on the logged in user.

- Local user – a user locally logged into the machine will be able to set the LOGIQ™ S8 to Disruptive mode or allow a Disruptive mode request from a remote user through the Service desktop. The local user must have Authorize Remote Service Access to allow Disruptive mode. If the local user does not have this right, the remote user's request will be automatically denied.
- Remote user – a user remotely accessing the LOGIQ™ S8 will not be able to automatically switch Disruptive mode to On. The logged in user (user actually logged on to the LOGIQ™ S8) needs to have the ability to grant remote access. The logged in user will be notified through a dialog box and asked to allow Disruptive mode.

NOTE: Change Password and Disk Defragment are not available for the remote user whether Disruptive mode is On or Off.

7-6-3 Color statuses

Throughout the Service desktop, colors indicate the following:

- Green – Status is normal
- Orange – Status is a warning
- Red – Status is an error

7-6-4 Licenses

With Service Basic Access (Class A), these are the available options:

- HOME
- Utilities
  - Change Password
  - Data Transfer
  - Delete Files
  - Gather Logs
  - Network Capture
  - SSA License
  - Third Party Licenses
- Options
- Agent Configuration

7-6-5 Home

Home configurations vary depending upon the purchased service level.

Figure 7-49 Home with Class A Access

For more information, see:

- "System Information" on page 7-50
- "Software Status" on page 7-52
- "Connected Probes" on page 7-53

System Information

System Information displays general information about the LOGIQ™ S8. When the LOGIQ™ S8 has been successfully configured with the back office, these elements will have the corresponding values:

- **Agent Registered** will be **Yes**
- **Agent Quarantine** will be **No**
- **Agent CRM Verified** will be **Yes**

The information on **System Information** is available to all service class licenses.

To access **System Information**, navigate to **Utility (second page) > Service** > **Home**.

Figure 7-50 System Information

This table shows all the elements available on **System Information** with descriptions.

Table 7-4 System Information

Element	Description
CRM Number	Customer Relationship Management (CRM) number. System identifier assigned to the customer unit by the service region.
Agent Registered	Registered status of the agent. Valid values are: • Yes – The agent is registered in the back office. • No – The agent is not registered in the back office. • Not Available – The agent is not running or has not been configured.
Agent Quarantine	Quarantine status of the agent. Valid values are: • Yes – The agent has more than one device registered with the same CRM Number in the back office. • No – The agent has one device registered with the listed CRM Number in the back office. • Not Available – The agent is not running or has not been configured.
Agent CRM Verified	CRM verified status of the agent. Valid values are: • Yes – The agent is verified in the back office. • No – The agent is not verified in the back office. • Not Available – The agent is not running or has not been configured.
Model Number	GE part number for the LOGIQ™ S8. The same number as listed on the rating plate.
Serial Number	Serial number of the LOGIQ™ S8. The same number as listed on the rating plate.
System Type	Product name of the LOGIQ™ S8.
Facility	Name of the hospital or facility where the LOGIQ™ S8 is installed.

For more information, see:

• "Home" on page 7-49

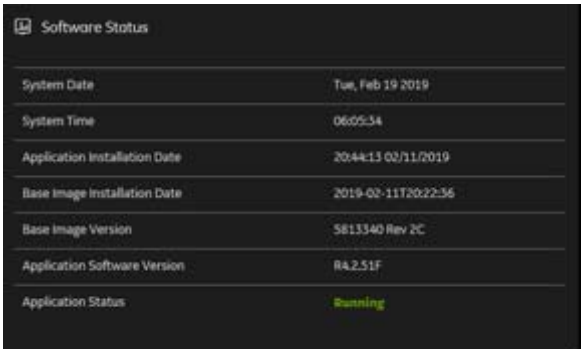
Software Status

Use **Software Status** to view general information about the software installed on the LOGIQ™ S8.

The information on **Software Status** is available to all service class licenses.

To access **Software Status**, navigate to **Utility (second page) > Service** > **Home**.

Figure 7-51 Software Status



This table shows all the elements available on **Software Status** with descriptions.

Table 7-5 Software Status

Element	Description
System Date	Current date in the format <day>, <month> <date> <year>.
System Time	Local time based on the last time the system desktop was refreshed in the format <hh:mm:ss>.
Application Installation Date	Date the application software was installed. The application software includes the LOGIQ™ S8 product-specific software.
Base Image Installation Date	Date the base image software was installed. The base image software includes the Windows operating system and other supporting software.
Base Image Version	Version number (part number) of the base image software.
Application Software Version	Version number of the application software.
Application Status	Status of the application. Valid values are: • Running • Stopped

For more information, see:

- "Home" on page 7-49

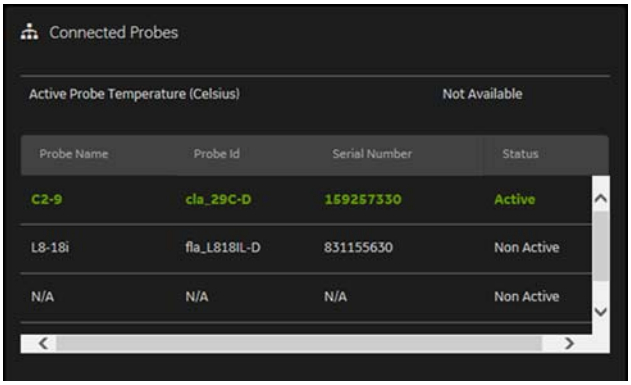
Connected Probes

Connected Probes shows probes connected to the LOGIQ™ S8. The order on the user interface is top down matching the left-to-right order on the LOGIQ™ S8.

The information on **Connected Probes** is available to all service class licenses.

To access **Connected Probes**, navigate to **Utility (second page) > Service** > **Home**.

Figure 7-52 Connected Probes



This table shows all the elements available on **Connected Probes** with descriptions.

Table 7-6 Connected Probes

Element	Description
Active Probe Temperature (Celsius)	When available, temperature of the active probe. Not all probes report temperature. The most common probe to report temperature is the TEE probe.
Probe Name	Name of the probe connected to the LOGIQ™ S8.
Probe ID	Identifier of the probe connected to the LOGIQ™ S8.
Serial Number	Serial number of the probe connected to the LOGIQ™ S8. If the serial number of the probe is not available, then **N/A** displays.
Status	Statuses of the probe connected to the LOGIQ™ S8. Valid values are: • Active • Non Active

For more information, see:

• "Home" on page 7-49

7-6-6 Utilities

Utilities configurations vary depending upon the service class.

For more information, see:

- "Change Password" on page 7-55
- "Data Transfer" on page 7-57
- "Delete Files" on page 7-59
- "Gather Logs" on page 7-60
- "Network Capture" on page 7-61
- "SSA License" on page 7-63
- "Third Party Software Licenses" on page 7-64

Change Password

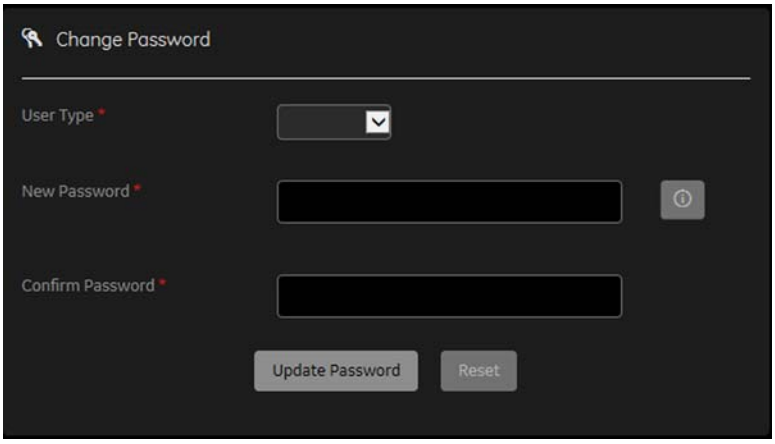
Change Password allows you to change the password for a specified user type.

CAUTION ***RISK OF LOSING DATA.***
IF THE PASSWORD IS LOST, GE WILL NOT BE ABLE TO RECOVER OR RESET IT. LOSS OF A PASSWORD MAY RESULT IN THE LOSS OF PATIENT DATA.

The information on **Change Password** is available to all service class licenses. **Change Password** is not available through a remote connection.

To access **Change Password**, select **Utility (second page) > Service > Utilities > Change Password**.

Figure 7-53 Change Password



This table shows all the elements available on **Change Password** with descriptions.

Table 7-7 Change Password

Element	Description
User Type	Type of user for the password reset. • GEService – Windows user for GE Service. • SVCService – Windows user loaded with the base image load software.
New Password	New password according to the password requirements (14-25 characters including one upper cap, one lower cap, one number, and one symbol).
Confirm Password	Password you entered in **New Password**.
Update Password	Select to update the password.
Reset	Select to reset the information.

To change the password:

NOTE: Before changing the GEService password (the default is SvcForward123$), make sure the *LOGIQ™ S8* is connected to the network and the agent is configured. The GEService password is used to perform portions of remote service. If the password is changed and the system information is not updated, it may slow down remote service. Both file transfer and SSH depend on the GEService password.

To change the service desktop user password:

1.) Navigate to **Utility (second page) > Service > Utilities**, and then select **Change Password**.

2.) From **User Type**, select one of the following:

- **GEService** – This is the Windows user for GE Service. Both file transfer and SSH depend on this user and password combination. When using SSH in FFA, the user and password will always be requested. Entering the incorrect password multiple times will lock you out. When changing this password, the LOGIQ™ S8 should be online (check the online icon at the bottom of the screen) so the back office updates. If the password is changed when offline, the back office will not be updated and you will have to change the password again with the LOGIQ™ S8 online. There is no notification when this password has been changed. Changes to this password do not affect logs sent to the GE Service data lake.
- **SVCService** – This is the Windows user loaded with the base image load software. You will never be prompted for this password. When it is set to default (no password selected), a randomly generated password will be supplied by the system. If this password is changed with **Change Password**, the base image software will automatically store the new password in the system and it will be fixed to the value entered. The SVCService password will not be requested of any user. It is only used by the LOGIQ™ S8 software.

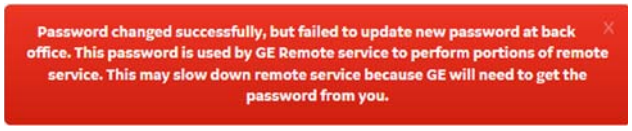
CAUTION **RISK OF LOSING DATA.**

GE WILL NOT BE ABLE TO RECOVER OR RESET CHANGED PASSWORDS. SECURELY RECORD THE NEW PASSWORD.

3.) In **New Password** type a new password according to the password requirements (14-25 characters including one upper cap, one lower cap, one number, and one symbol).

4.) In **Confirm Password**, type the new password.

5.) Click **Update Password**. The following message displays if the LOGIQ™ S8 is offline.



6.) When a SVCService user password has been changed, reboot the LOGIQ™ S8 to reflect the password change.

Data Transfer

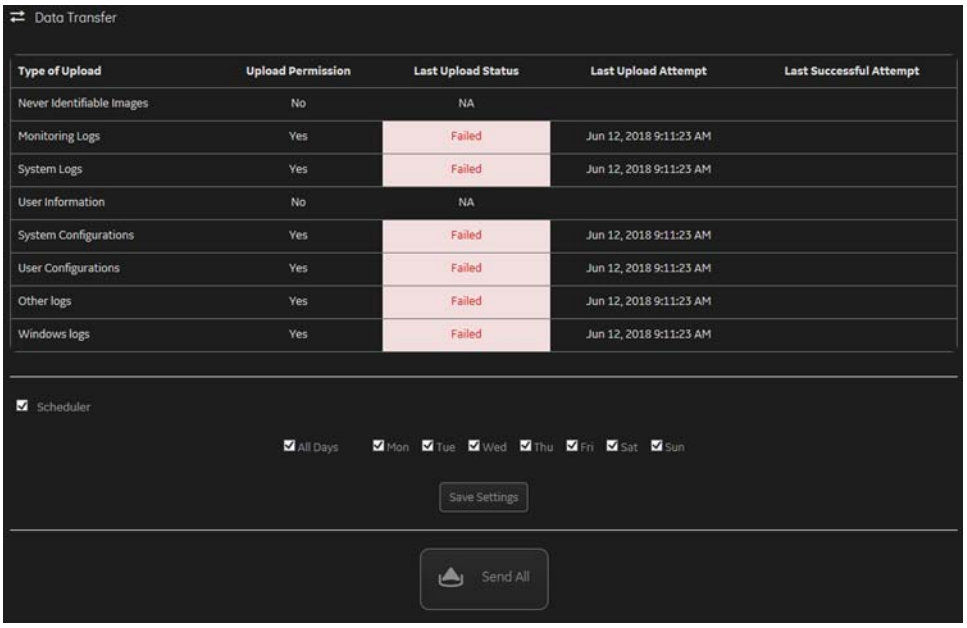
Data Transfer provides a way to do the following:

- View information about past transfers of (APM) information.
- Set up automatic/scheduled transfer of allowed data files from the LOGIQ™ S8 to the server.
- Manually transfer data files allowed data files from the LOGIQ™ S8 to the server.

The information on **Data Transfer** is available to all service class licenses.

To access **Data Transfer**, select **Utility (second page) > Service > Utilities > Data Transfer**.

Figure 7-54 Data Transfer



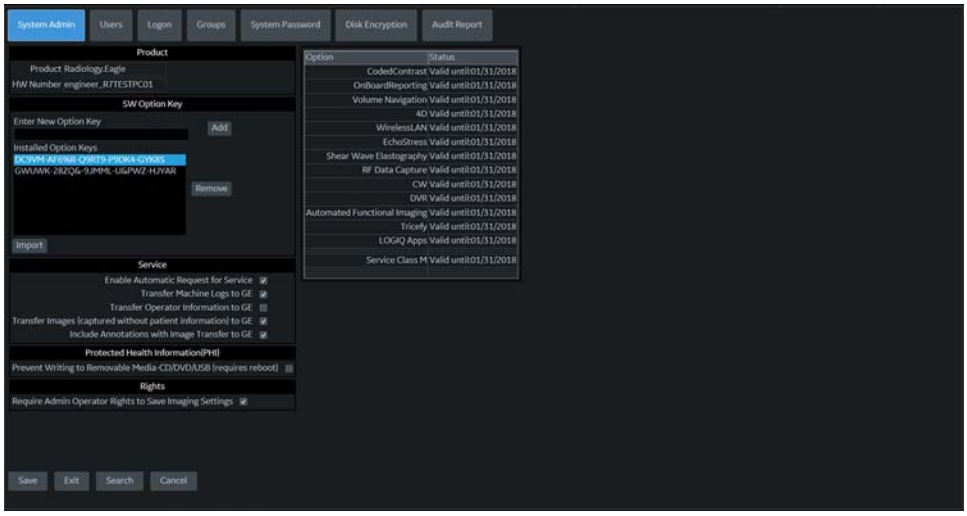
This table shows all the elements available on **Data Transfer** with descriptions.

Table 7-8 Data Transfer

Element	Description
Type of Upload	Type of log file. For example, **Incremental Logs** or **Full Logs**. **Monitoring Logs**, **System Logs**, and **Windows Logs** are incrementally transferred when automatic transfer is enabled. To enable automatic transfer, navigate to **System Admin** and, under **Service**, check **Enable Automatic Request for Service**.
Upload Permission	Whether the permission to upload the log file is allowed or not.
Last Upload Status	Whether the last log file upload was successful or not.
Last Upload Attempt	Date and time the last log file upload was attempted.
Last Successful Upload	Date and time the last log file was successfully uploaded.
Scheduler	When selected, enables the related day selections. For example, **All Days**, **Monday**, and **Tuesday**.
Save Settings	Saves the information.
Send All	Manually send the selected log files to the server.

To configure automatic data transfers:

1.) Navigate to **ADMIN > System Admin**.



2.) On **System Admin**, configure these settings:
- **Transfer Machine Logs to GE** – Default is checked
- **Transfer Operator Information to GE**
- **Transfer Images (captured without patient information) to GE** – Default is checked.

3.) Click **Save**.

4.) Navigate to **Utility (second page) > Service > Utilities > Data Transfer**.

5.) On **Data Transfer**, select **Scheduler**, and then select the days to perform the data transfer.

6.) Click **Save Settings**.

7.) To manually perform a data transfer, click **Send All**.

Delete Files

Delete Files displays all the files and folders present in the D:\Service folder and allows for their deletion. Deleting unneeded files improves performance and reduces the need to defragment the disk drive.

The information on **Delete Files** is available to all service class licenses.

To access Delete Files, select **Utility (second page) > Service > Utilities > Delete Files**.

Figure 7-55 Delete Files

This table shows all the elements available on **Delete Files** with descriptions.

Table 7-9 Delete Files

Element	Description
Delete Files	Displays the files that are available for deletion.
Delete	Deletes the selected files.

To delete files:

1.) Navigate to select **Utility (second page) > Service > Utilities > Delete Files**.
2.) Under **Delete Files**, select the available folders and files that you want to delete.
3.) Click **Delete**.
4.) In the resulting dialog box, click **Delete** and then click **OK**.

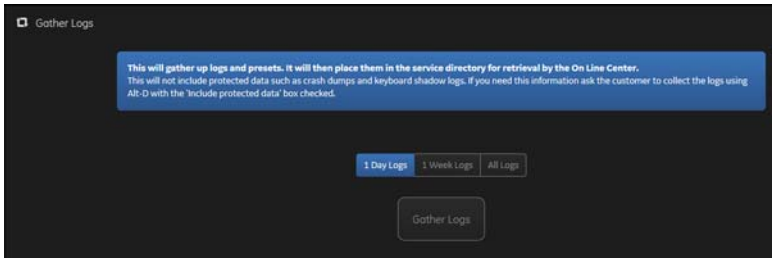
Gather Logs

Gather Logs provides a way to collect system logs and place the log files in the D:\Service directory for retrieval by the online center. These log files do not include protected data such as crash dumps and keyboard shadow logs. The customer can collect logs (including protected data) using Alt+D when Protected Data is checked. Log files are compressed into a .zip file and the file path and name display. If the application software is not running, use the **Gather Logs** shortcut on the Windows desktop.

The information on **Gather Logs** is available to all service class licenses.

To access **Gather Logs**, select **Utility (second page) > Service > Utilities > Gather Logs**.

Figure 7-56 Gather Logs



This table shows all the elements available on **Gather Logs** with descriptions.

Table 7-10 Gather Logs

Element	Description
1 Day Logs	When selected, gathers log files for one day.
1 Week Logs	When selected, gathers log files for one week.
All Logs	When selected, gathers all available log files.
Gather Logs	Select to gather the log files for the selected time period.

To gather log files:

1.) Navigate to **Utility (second page) > Service > Utilities > Gather Logs**.
2.) Select one of the following:
- 1 Day Logs
- 1 Week Logs
- All Logs

3.) Click **Gather Logs**. In the resulting dialog box, record the location of the log files and click **OK**.
4.) When the gather log operation is complete, click the notification icon in the banner to view the location of the log files.

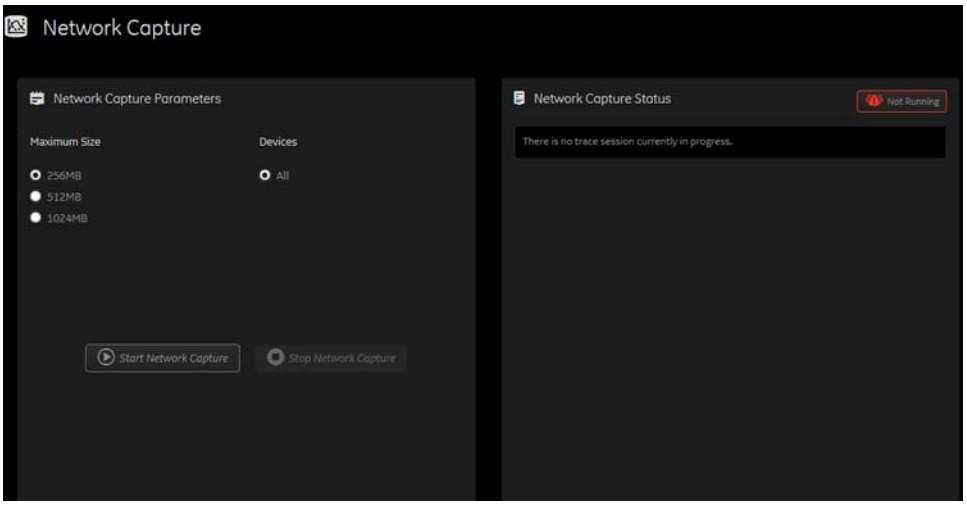
Network Capture

Network Capture displays network traffic between the LOGIQ™ S8 and configured devices. A network capture outputs two log files: one for main logging with no protected information and another including protected information. These log files are useful when debugging connectivity issues. Because these log files can be large, they are only kept for one week.

The information on **Network Capture** is available to all service class licenses.

To access **Network Capture**, select **Utility (second page) > Service > Utilities > Network Capture**.

Figure 7-57 Network Capture



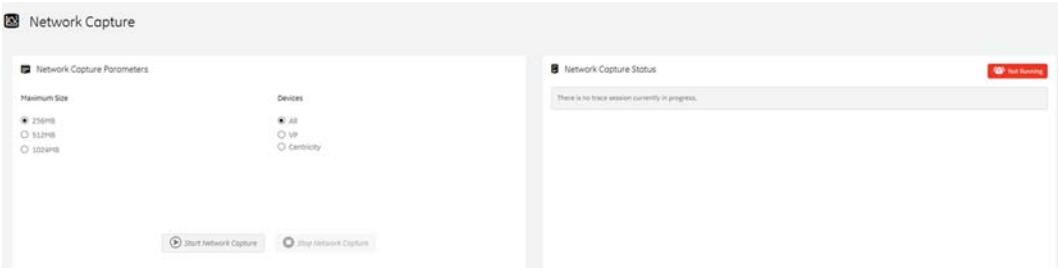
This table shows all the elements available on **Network Capture** with descriptions.

Table 7-11 Network Capture

Element	Description
Network Capture Parameters	
Maximum Size	Allowed size of the generated log file. Valid value are: • 256MB • 512MB • 1024MB
Devices	DICOM-configured devices for which you want to capture information. If no additional devices are configured, only All will be available.
Start Network Capture	Select to start the process. This causes the network capture to start, enables the **Stop** button, and updates the **Network Capture Status** pane and changes the Status to **Running**.
Stop Network Capture	Select to stop the process.
Network Capture Status	
	Displays information about the status of the network capture. The language setting for this information is set in Windows and not through the Service desktop or LOGIQ™ S8 application software.
	Displays the current status of the network capture. Valid values are: • Not Running • Running

To perform a network capture:

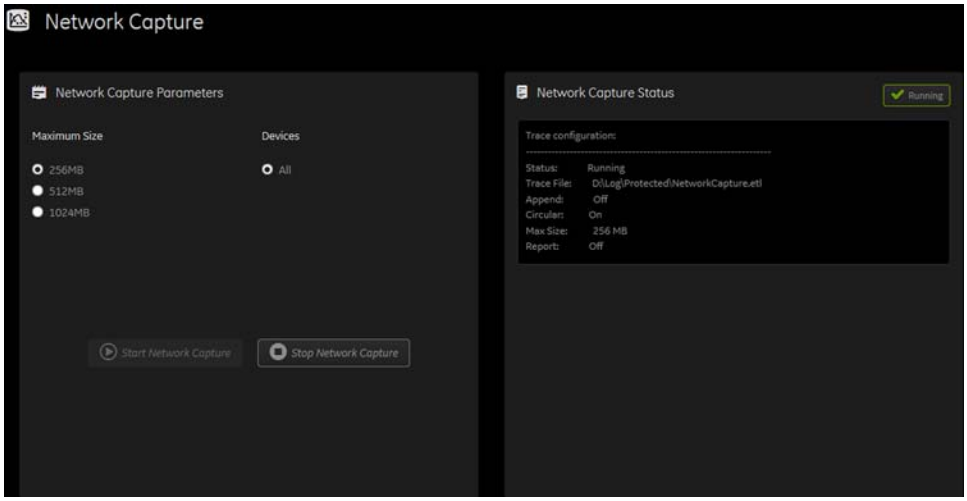
1.) Navigate to **Utility (second page) > Service > Utilities > Network Capture**.



2.) From **Network Capture**, do the following:

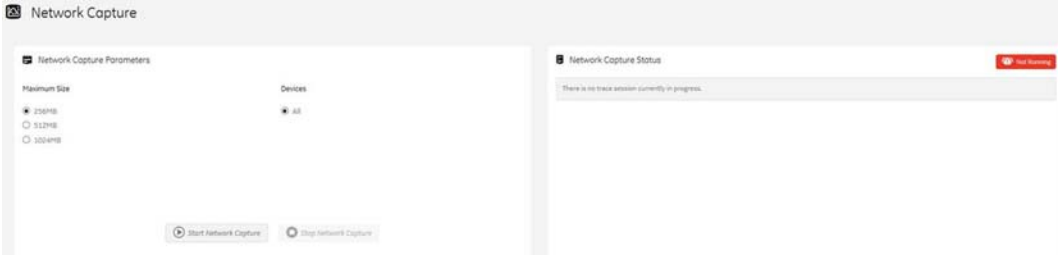
- Under **Maximum Size**, select the allowed size of the generated log file.
- Under **Devices**, select the DICOM-configured device for which you want to capture information. If no additional devices are configured, only **All** will be available.

3.) Select **Start Network Capture** to start the process. This causes the network capture to start, enables the **Stop** button, and updates the **Network Capture Status** pane and changes the **Status** to **Running**.



4.) Click the **Stop** button to end data collection. Stopping is a two-step process:

- Stops the data collection and immediately closes the .etl file.
- Collects additional diagnostic data that may help diagnose network issues. When the file is closed, you see “There is no trace session currently in progress”. When the remaining data is collected and the .cab file is closed, you are notified in the banner.



SSA License

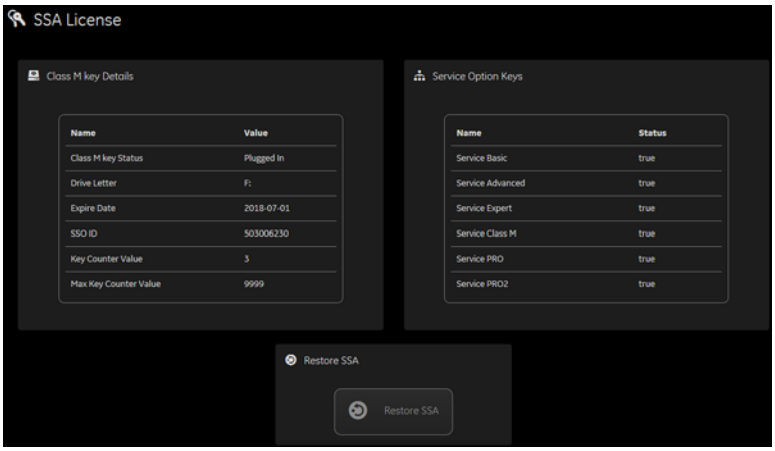
SSA License provides a way to do the following:

- When inserted, view the details of an SSA key.
- View the status of the service class options.
- Restore an SSA license when the SSA key is not validating or when a remote log in shows as a Class A user.

The information on **SSA License** is available to all service class licenses.

To access **SSA License**, select **Utility (second page) > Service > Utilities > SSA License**.

Figure 7-58 SSA License



This table shows all the elements available on **SSA License** with descriptions.

Table 7-12 SSA License

Element	Description
Class M Key Details	
Class M Key Status	Status of the SSA key. Valid values are: • Not Plugged In • Plugged In
Drive Letter	Drive where the SSA key is plugged into the LOGIQ™ S8.
Expire Date	Date the SSA key is set to expire.
SSO ID	Identifier for the user assigned to the SSA key.
Key Counter Value	Number of times the SSA key has been used.
Max Key Counter Value	Number of remaining times the SSA key can be used.
Service Option Keys	
Name	Name of the service class option.
Status	Status of the access to the associated service class option. Valid values are: • True • False
Restore SSA	Restores the SSA license to the SSA key.

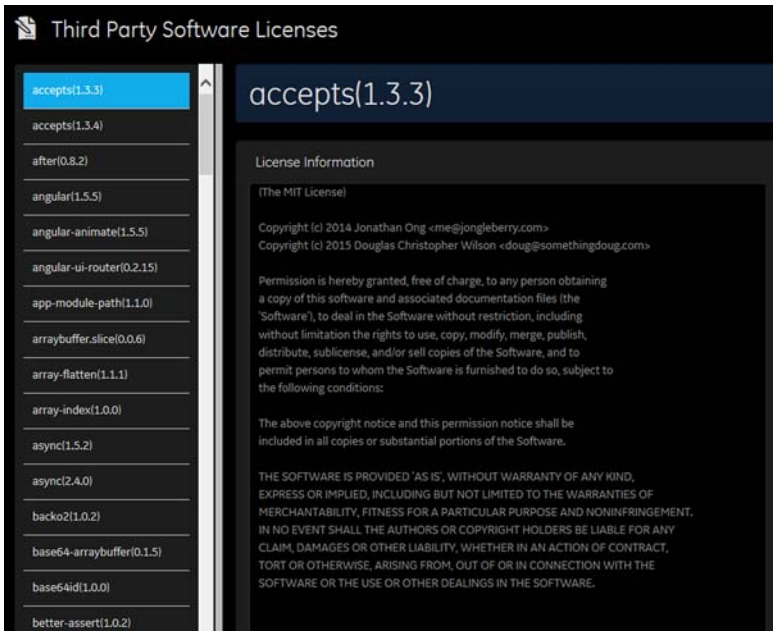
Third Party Software Licenses

Third Party Software Licenses displays the third-party software licenses used as part of the service platform.

The information on **Third Party Software Licenses** is available to all service class licenses.

To access **Third Party Software Licenses**, select **Utility (second page) > Service > Utilities > Third Party Software Licenses**.

Figure 7-59 Third Party Software Licenses



7-6-7 Options

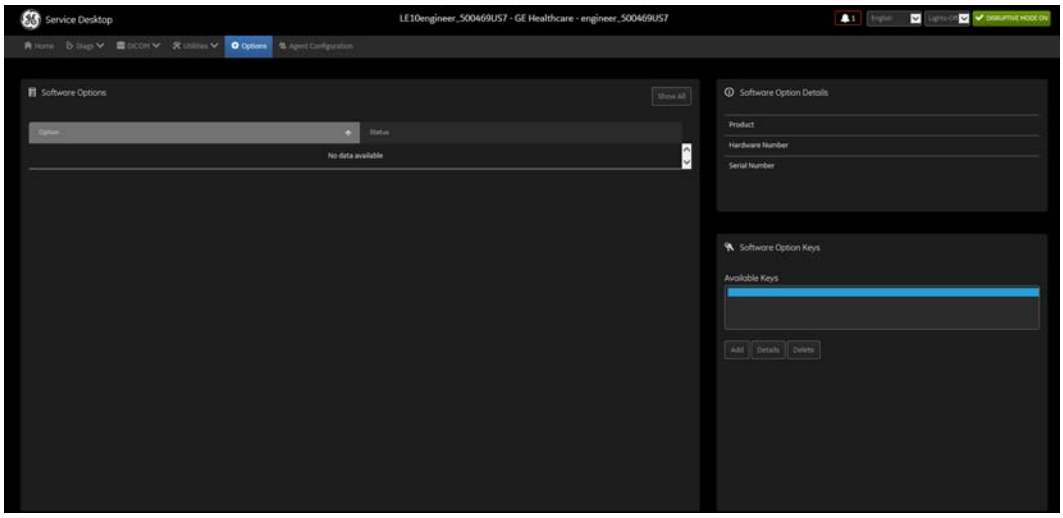
Use **Options** to:

- View software options.
- View software option details.
- Add (or delete) a valid option key, add a duplicate option key, not add an invalid option key, and ask for confirmation before deleting an option key.
- View software option key details. Key details are a list of options that are enabled by a particular key. Under **Available Keys**, highlight the option string, select **Details** and then view the options on the left side of the screen. Press **Show All** to view all of the activated options.

The information on **Options** is available to all service class licenses.

To access **Options**, navigate to **Utility (second page) > Service > Options**.

Figure 7-60 Options



This table shows all the elements available on **Options** with descriptions.

Table 7-13 Options

Element	Description
Software Options	
Option	Software options on the LOGIQ™ S8.
Status	Status of the options on the LOGIQ™ S8.
Software Option Details	
Product	Name of the product.
Hardware Number	Number for the hardware. The hardware number is the hash of the serial number that is used to generate the option key.
Serial Number	Serial number of the LOGIQ™ S8.
Software Option Keys	
Available Keys	List of the option keys installed on the LOGIQ™ S8.

7-6-8 Agent Configuration

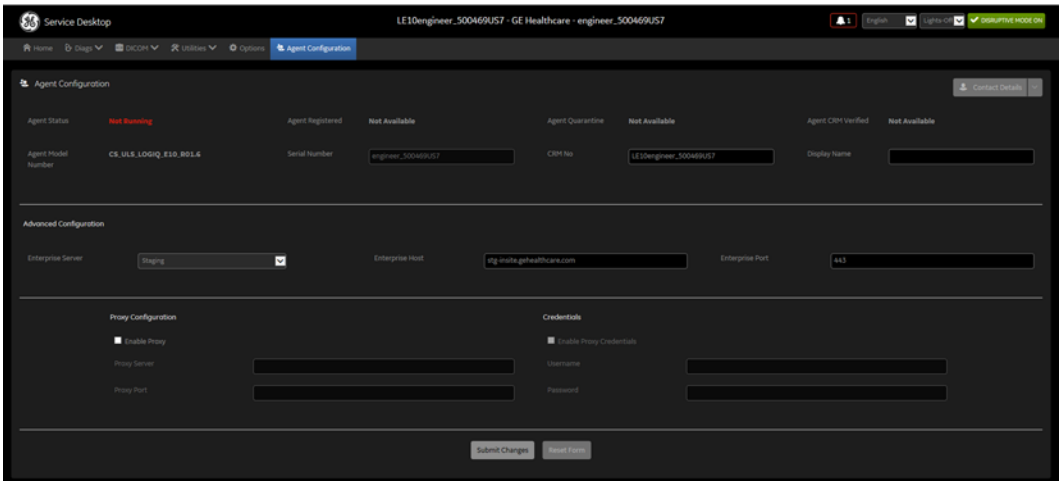
Use **Agent Configuration** to:

- Edit and configure the following:
  - Enterprise host name in the agent
  - Enterprise port number in the agent
  - Proxy server in the agent
  - Proxy port in the agent
  - CRM number in the agent
  - Display name in the agent
- Set the serial number in the agent
- Enter the username and password for the proxy
- Reset the edited unsaved value
- Update contact details

The information on **Agent Configuration** is available to all service class licenses.

To access **Agent Configuration**, navigate to **Utility (second page) > Service > Agent Configuration**.

Figure 7-61 Agent Configuration



This table shows all the elements available on **Agent Configuration** with descriptions.

Table 7-14 Agent Configuration

Element	Description
Agent Configuration	
Contact Details	Phone number for the person at the customer site a GE remote service engineer would contact. The phone number is entered during installation and reviewed at every service call to make sure the information is correct.
Agent Status	Status for the agent. Valid values are: • Running • Not Running

Table 7-14 Agent Configuration

Element	Description
Agent Registered	Registered status of the agent. Valid values are: • Yes – The agent is registered in the back office. • No – The agent is not registered in the back office. • Not Available – The agent is not configured or running.
Agent Quarantine	Quarantine status of the agent. Valid values are: • Yes – The agent has more than one device registered with the same CRM Number in the back office. This scanner cannot send data back to GE or be remotely accessed. • No – The agent has one device registered with the listed CRM Number in the back office. • Not Available – The agent is not configured or running.
Agent CRM Verified	CRM verified status of the agent. Valid values are: • Yes – The agent is verified in the back office. • No – The agent is not verified in the back office. • Not Available – The agent is not configured or running.
Agent Model Number	GE part number for the LOGIQ™ S8. The same number as listed on the rating plate.
Serial Number	Serial number of the agent (read-only). If the agent is not registered with a serial number, this field is populated with the serial number of the LOGIQ™ S8. The serial number of the agent is tied to the serial number of the LOGIQ™ S8.
CRM No	Customer Relationship Management (CRM) number. System identifier assigned to the customer unit by the service region. CRM is pre-populated by adding LE10 to the CRM number. The CRM number of the LOGIQ™ S8 is editable.
Display Name	Displayed name of the agent.
Advanced Configuration	
Enterprise Server	Name of the enterprise server.
Enterprise Host	Number of the enterprise host.
Enterprise Port	Number of the enterprise port.
Proxy Configuration	
Enable Proxy	Enables the proxy server.
Proxy Server	When Enable Proxy is selected, name of the proxy server IP.
Proxy Port	When Enable Proxy is selected, number of the proxy server port.
Credentials	
Enable Proxy Credentials	Enables the proxy credentials.
Username	When **Enable Proxy Credentials** is selected, name of the user.
Password	When **Enable Proxy Credentials** is selected, password for the user.

Section 7-7
Troubleshooting Trees, Instructions and Tech Tips

7-7-1 Contents in this section

7-7-2 Shortcut Keys

There are several Shortcut keys to be utilized on the LOGIQ S8:

- **Alt + 1 or Alt + 2** to mark events in the log file. Used for the flagging intermittent issues during operation.
- **Alt + F10** = is the SW Shut Down.
  This is very important tool to shut-down the system. If the system can be shut-down by using these keys it means that SW is working and the problem could be the ON/OFF switch or the wire that carries the shut-down signal.
- **Alt + F5** or **F11** for the echo simulator (keyboard simulation), brings up or removes the frontpanel simulator. It may be used with VCO to press buttons on the frontpanel that are not a standard key on your PC.
- **Alt + A** = to bring up a cursor (Alt + A stands for “Arrow“).
- **Alt + D** to capture the scanner logs (See: 7-3-4 "Collecting a Screen Capture with Logs" on page 7-9).
- **Alt + N** activates the Network Sniffer monitor, or restores it if it is minimized or hidden.

7-7-3 System does not boot up

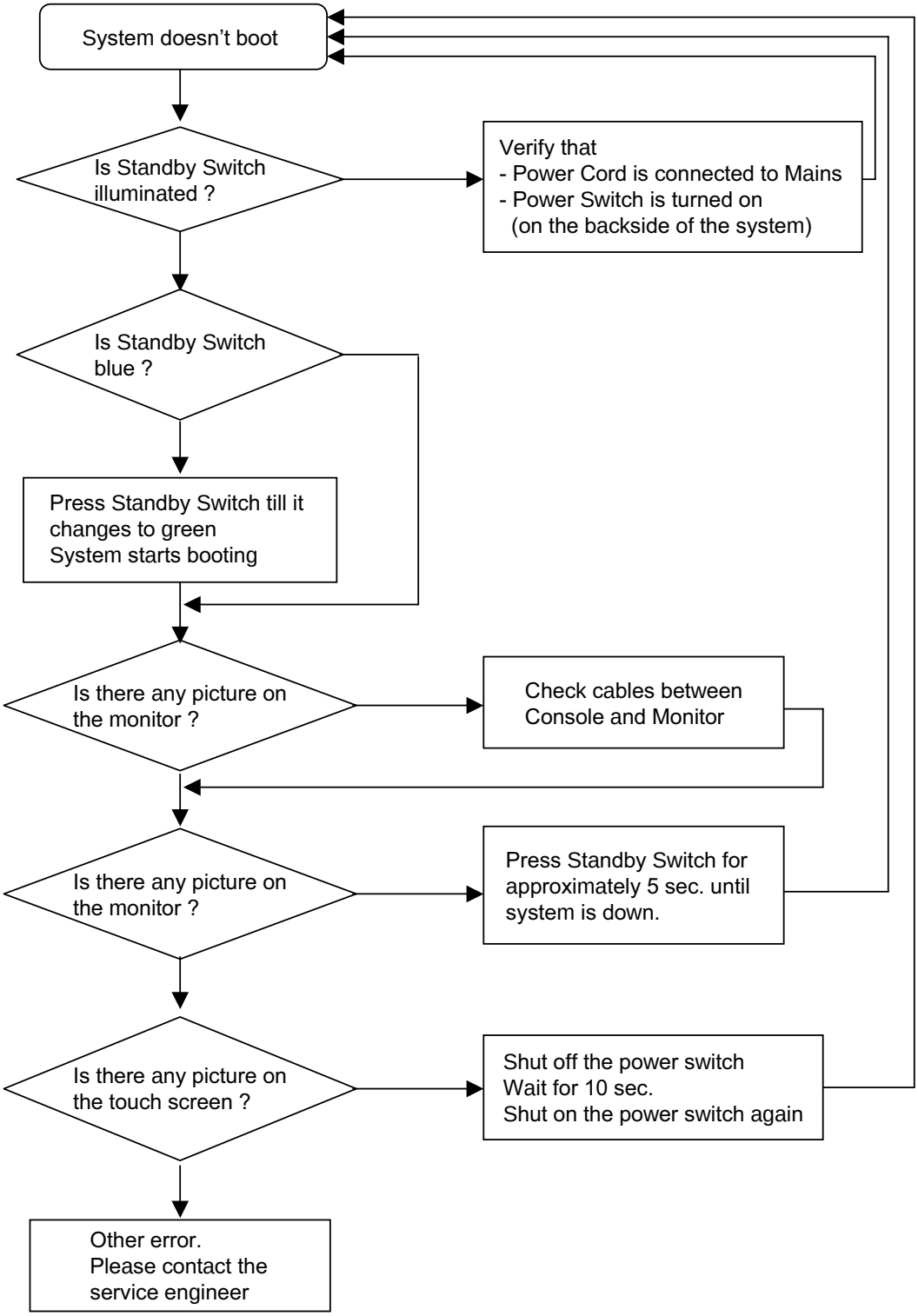


Figure 7-62 System does not Power On / Boot Up

7-7-4 Noise disturbs the Image

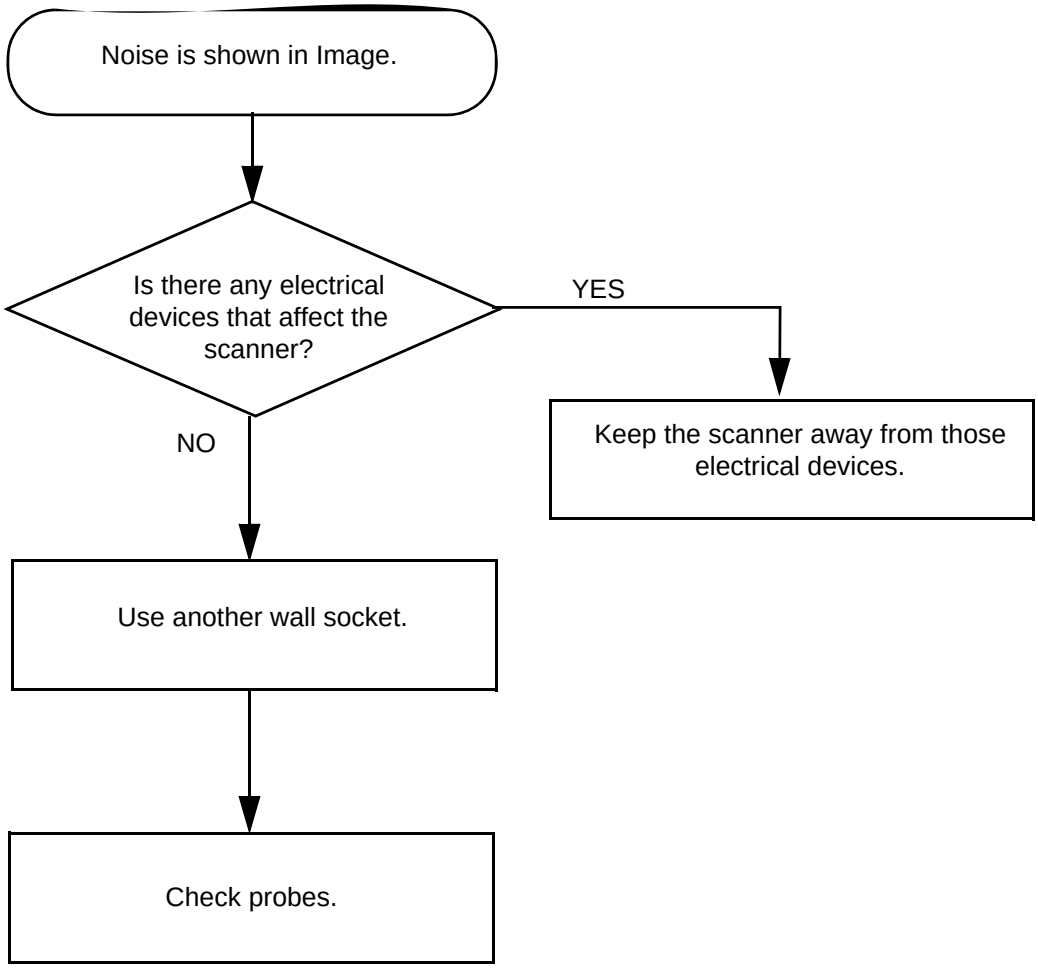


Figure 7-63 Noise disturbs the Image - Troubleshooting

7-7-5 Trackball - Impaired sensitivity

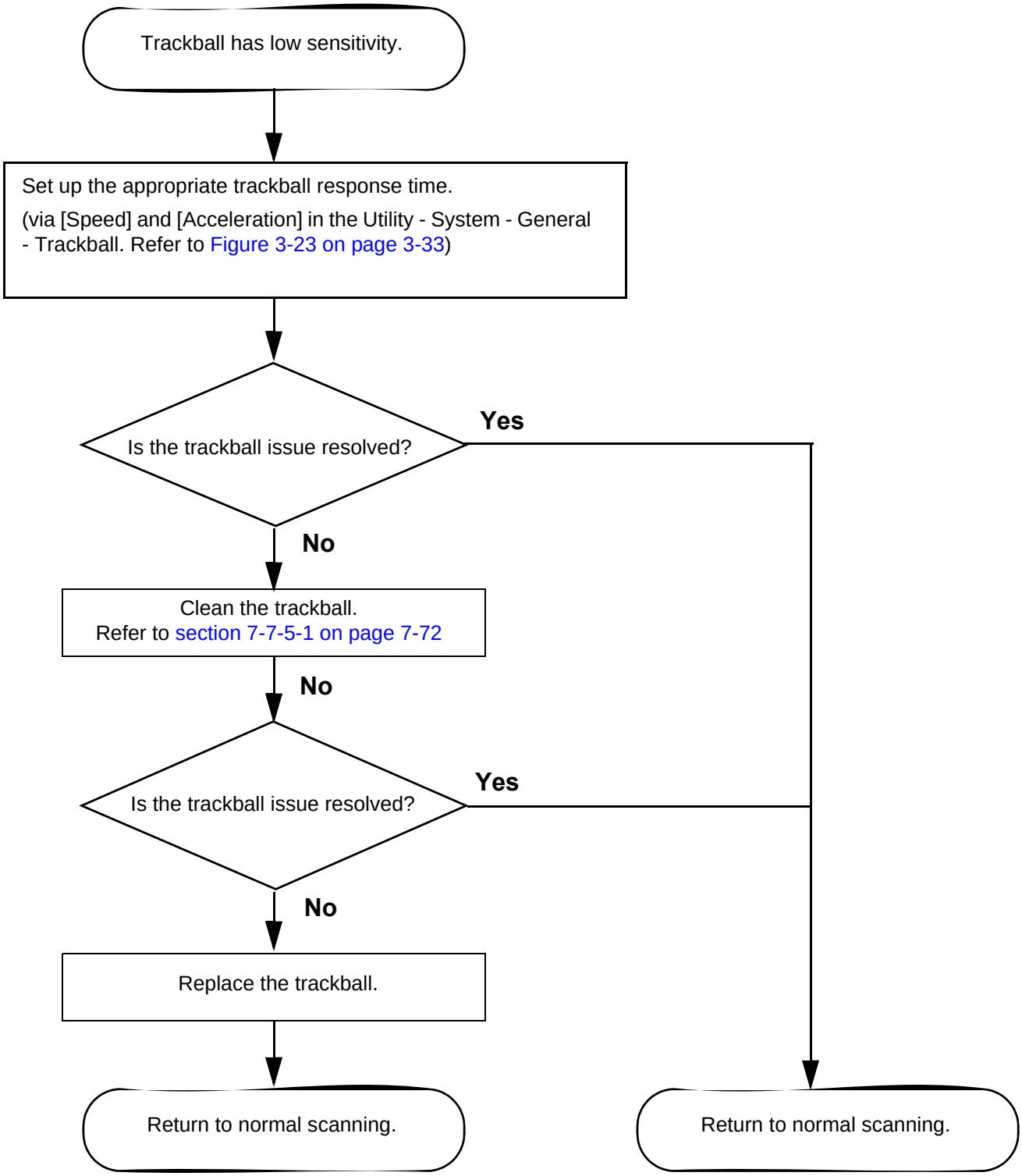


Figure 7-64 Trackball - Impaired sensitivity

7-7-5-1 Cleaning the trackball

To keep the right response of the trackball, frequently clean the trackball with a disposable soft, dry, lint free cloth; e.g. lens cleaner cloth, in accordance with procedure below.

1.) Remove the ball from the operation panel.

2.) Clean the crane ring and ball.

3.) Clean the aiming balls, the protection covers over the X/Y position-sensor. Carefully remove the smudges to avoid scratching to the protections when cleaning around the sensors.

4.) After cleaning, install it back into the operation-panel and confirm that the trackball moves smoothly.

7-7-6 Printer Malfunction

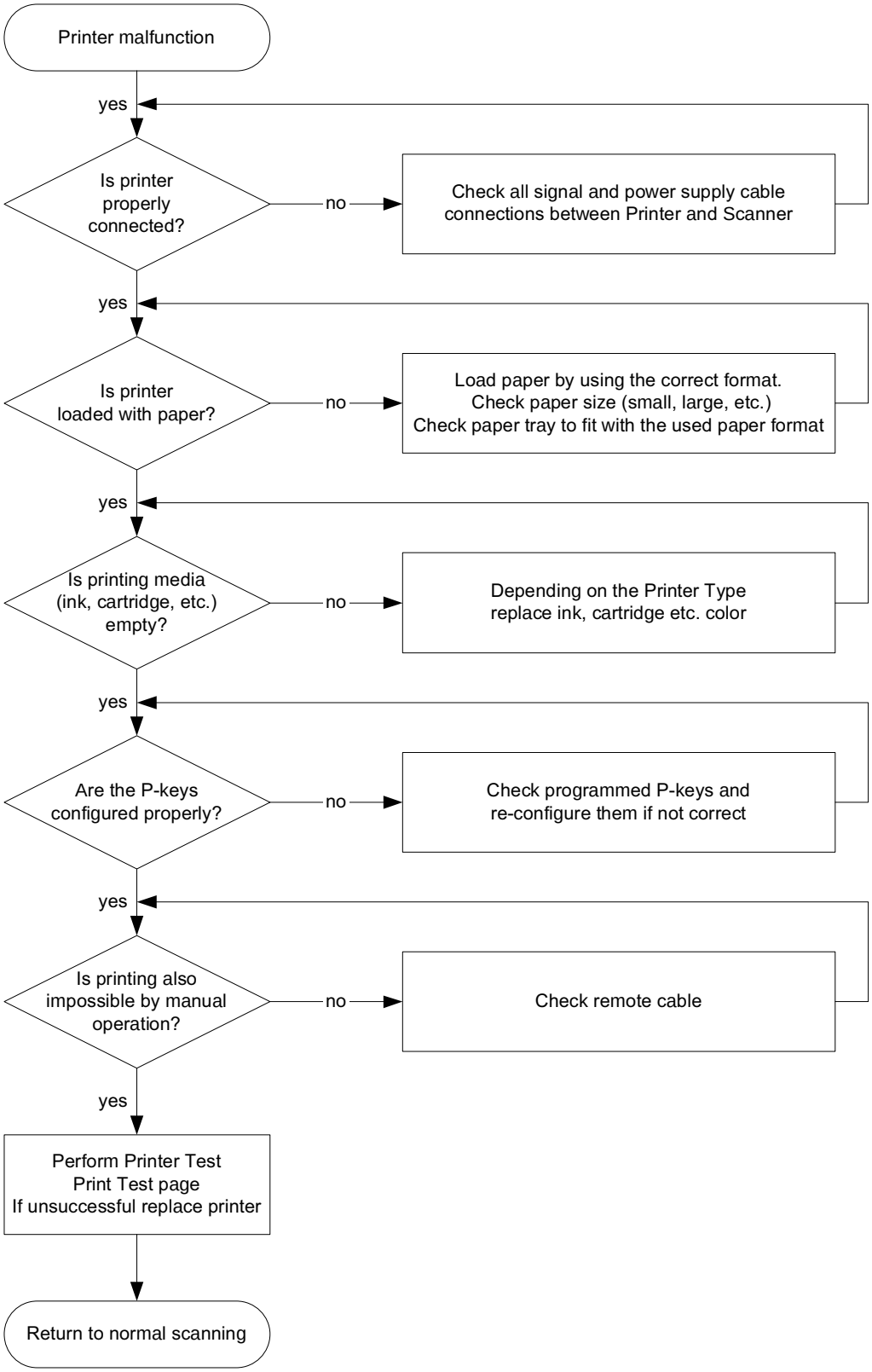
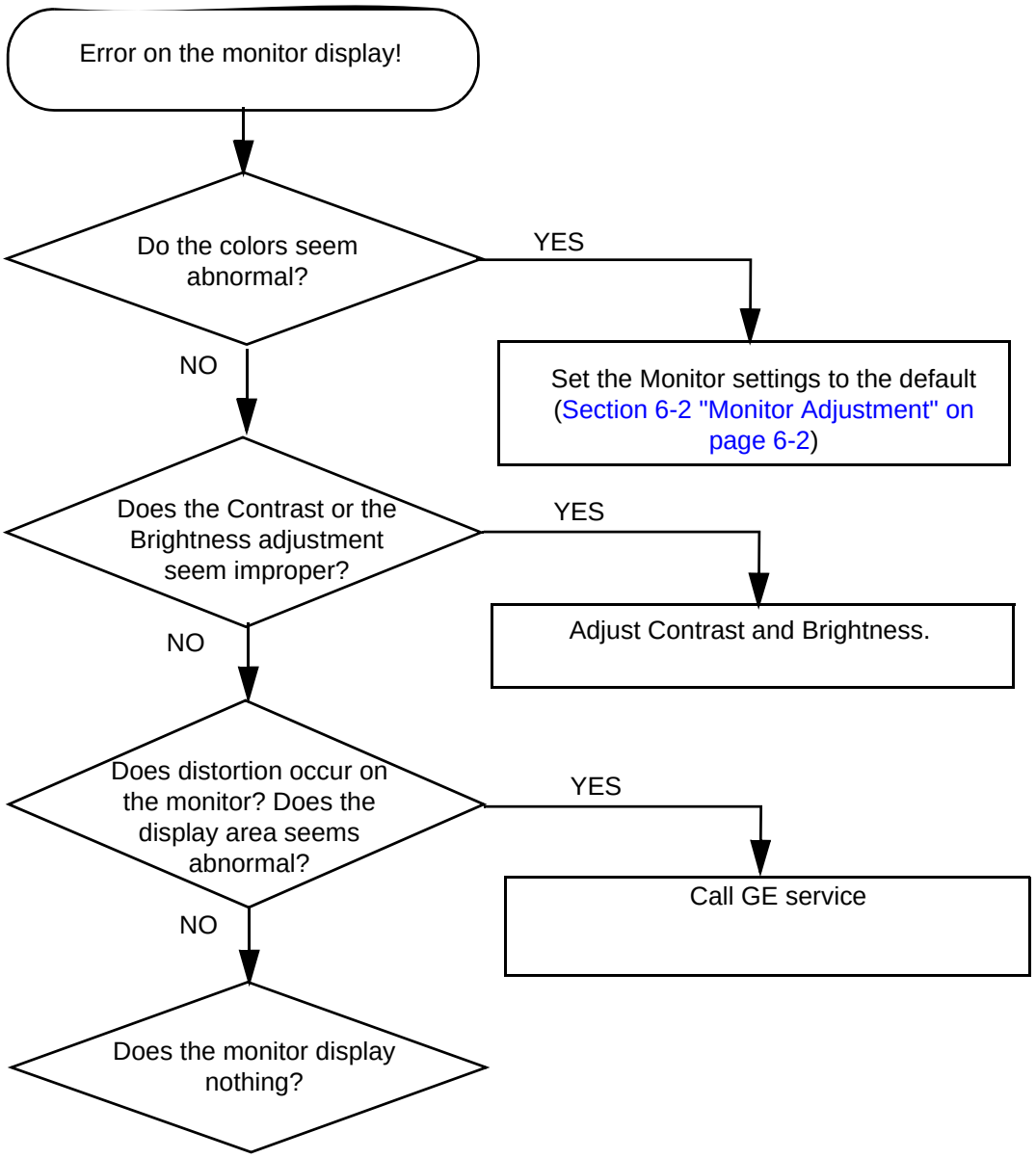


Figure 7-65 Printer Malfunction

7-7-7 19" Monitor Troubleshooting

NOTE: Reset the monitor settings to the factory defaults prior to troubleshooting the monitor. Refer to 6-2-1-2-3 "Memory Recall" on page 6-6.

Figure 7-66 Monitor Troubleshooting



- Monitor does not work
  - Verify power is present to monitor
  - Check if video is present at external DVI connection (you may need an external monitor)
- Prints do not match monitor
  - Verify factory default settings. Chapter 3 in the User Manual calls out suggested settings for various exam and lighting conditions.
- Video test patterns are not clear, bright, parallel or square
  - Replace the monitor

7-7-8 Universal Video Converter Troubleshooting

Fault symptom	Check these items
No Image	Check the power cord is properly connected and power LED is lighting.
	Check each signal output setting is properly set. Refer to DIRECTION 5422470, LOGIQ S8 CABINET AND DEVICES INSTALLATION INSTRUCTIONS - Section7-3 or LOGIQ S8 Option Installation Instruction Chapter 4.
	Check the video cable is properly connected and HDMI LED is lighting.
	Check no pins of the video cable are bent.
	When a secondary monitor has plural input, check the channel is properly set.
	Check the UVC Dip switch setting. For 19” Monitor, Switch No.2 should be lower position (ON). For 22” and 23” wide monitor, Switch No. 8 should be lower position (ON).

7-7-9 4D Option Trouble shooting

Fault symptom	Check these items
Cannot select probe from touch panel	Make sure 4D option is installed.
Probe will not “sweep”. No image update.	Try another 3D/4D probe. If the new probe works, you have a bad probe.
Probe will “sweep” for a short time, then stops. Image update halts.	Try another 3D/4D probe. If the new probe works, you have a bad probe.
“Black” image area in the B-Mode image.	Try another 3D/4D probe. If the new probe shows the same IQ problem, this is probably not a 3D/4D specific issue.

7-7-10 Power Assistant Option Trouble Shooting

Fault symptom	Check these items
Short battery life(less than 20 minutes)	Replace Battery.
Temperature error	1. Clean Air Filter.
Cannot charge after long Discharging	If the battery discharges in Power Assistant Mode over a long period of time under the hot environment, the battery may not be started charge after about 30~90 minutes.
Brightness of LCD-monitor does not recover	Perform “Memory Recall” of LCD monitor. See section 6-2-1-2-3 on page 6-6.

7-7-11 Extended Battery Option Trouble Shooting

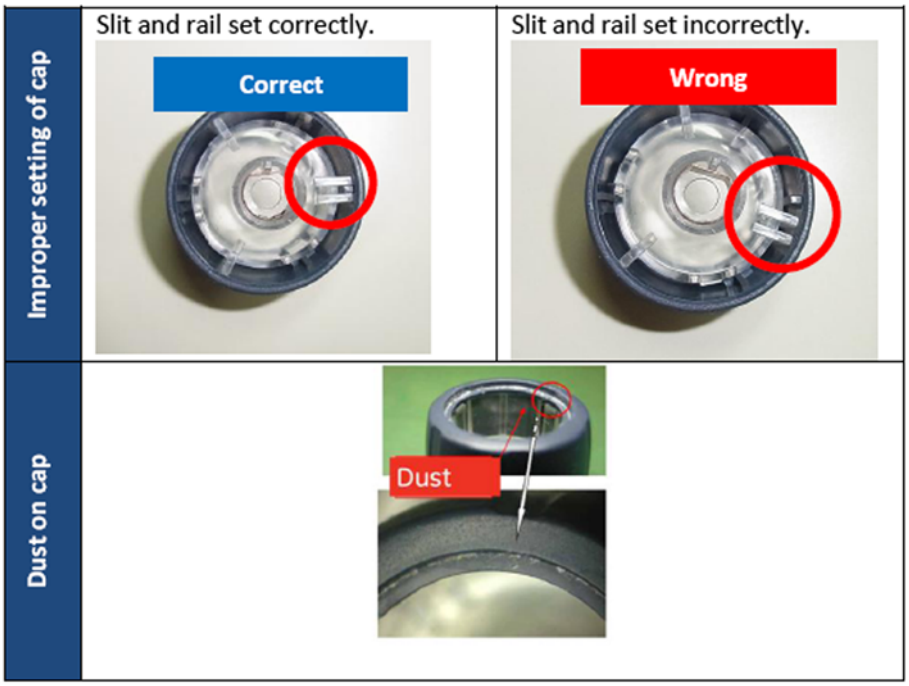
Table 7-15 Extended Battery Option Trouble Shooting

Fault symptom	Check these items
Cannot go to Off line scanning mode (system shutdown) System Error during Off-line scanning mode	Make sure Software version is R4 or later. Also Make sure if remaining Capacity is enough (capacity can be checked by clicking Battery-Icon on Main-display)
Cannot go to Off line scanning mode (unintentionally go to Power Assistant mode)	Make sure if “Always “is not selected on the following check box (Utility=>setting=>General). Note: LOGIQ S8/E8 R4 does not support Off-line-scanning function on PowerAssistant Option.
	Make sure if Battery Remaining Capacity is enough (if battery remaining capacity is quite low, system automatically go to Power saving mode)
Cannot use Printer Cannot use Universal Video Converter	This is system spec. AC-powered modules cannot be used on Battery-mode.
Short battery life(less than 60 minutes)	Replace all of 4 batteries. Battery operation time depends on the console configuration and scanning mode.
Beep sound starts while discharging	This is system spec. If “Battery Low Warning with Sound” checkbox (Utility=>setting=>General) is checked, the system plays a beep sound when the battery capacity is low.
Battery charge takes long time	This is system spec. It will take over 8 hours to complete charging of Extended battery (from empty, new batteries).
MAIN FAN starts operation after shutting down system.	This is system spec. From CPS3SB, “Battery-charging on Stand-by” function supported. MAIN-FAN continues operating during charge. After fully-charged, MAIN-FAN automatically stops. This function is available for both of PowerAssistant and Extended-battery R4 and later.

7-7-12 Mode encoder works twice when pushed button once

The cause may be improper setting or dust in a cap. Before replacing an encoder, verify the setting/dust of a cap.

NOTE: It occasionally sounds like a correct setting from a cap when assembled it improperly.



7-7-13 Sticky buttons

The cause may be dust/liquid into a button. Call GE Service.

7-7-14 Mode button failure

Other function works when push a mode button / Mode button fail to respond even if you push a button Call GE Service.

7-7-15 PC Printer Installation

If the following message displays when you connect the PC Printer first time to the system, execute the following procedures.

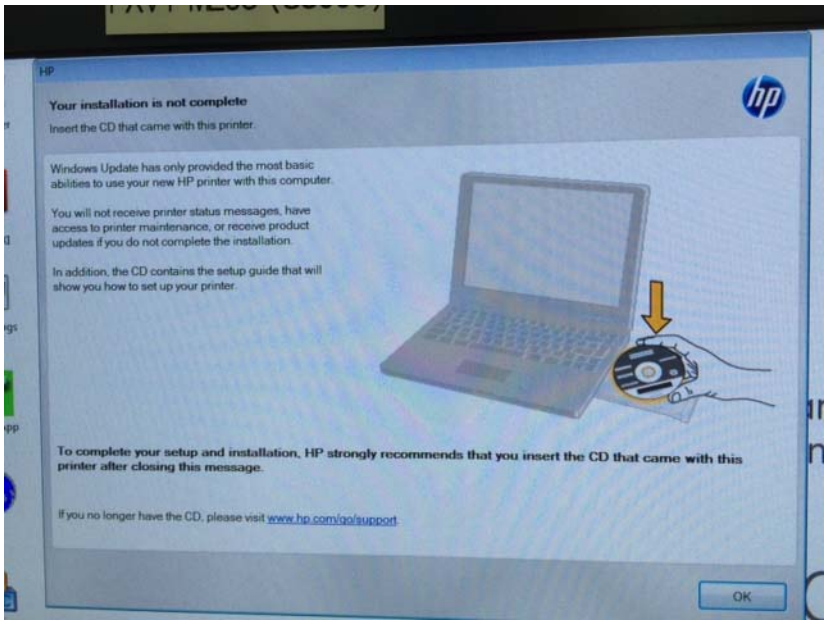


Figure 7-67 PC Printer message

1.) Click [OK] and shutdown the system.
2.) Restart the system.

7-7-16 FibroScan Module (FSIM) Trouble Shooting

Fault symptom	Check these items
Green LED on FibroScan Module is OFF	Call GE service
BLue LED on FibroScan Module is OFF	1. Make sure Green LED on FibroScan Module is ON.
	2. Reboot the system. If blue LED is still OFF after 90 seconds, call GE service.
White LED on FibroScan Module is OFF	1. Make sure Green LED on FibroScan Module is ON.
	2. Make sure Blue LED on FibroScan Module is ON.
	3. Reboot the system. If the White LED is still OFF, call GE service.
Below function is not showed on FibroScan view: - Amplitude mode (A mode) - Time Motion mode (TM mode) - Elastogram image - Probe selection - Probe pressure indicator - Liver targeting tool (LTT) 	1. Make sure FibroScan probe is connected to FibroScan module. Pull off the connected FibroScan probe from FibroScan module and reconnect it again. Apply pressure to FibroScan probe with your finger tip. If still not successful, go to step2.
	2. Make sure FibroScan probe (M/XL) is selected in the examination. Select the desired FibroScan probe on FibroScan tab on touch panel. Note that probe selection is successful only if the corresponding probe is connected to FibroScan module. The LED on probe will blink on a successful connection. Apply pressure to FibroScan probe with your finger tip. If still not successful, go to step3.
	3. Exit FibroScan mode, re-enter FibroScan mode, and Repeat step2. If still not successful, go to step4.
	4. Reboot the system. If A mode is not showed, call GE service.
CAP option is not available: - CAP result area is not showed on FibroScan view - CAP button is not showed on FibroScan tab on touch panel	1. Make sure CAP option is installed on the system.
	2. Reboot the system. If CAP option is still not available, call GE service.

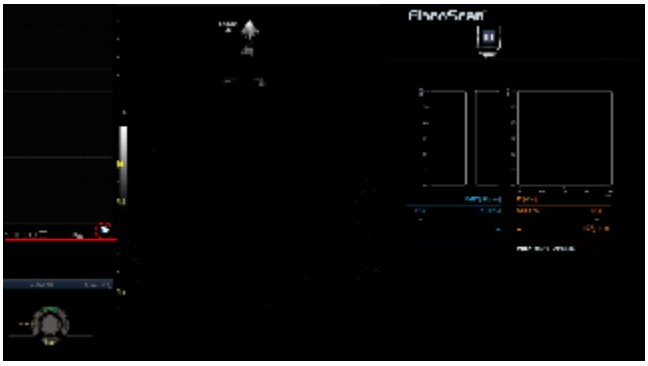
7-7-16-1 Note for FIbroscan

1.) Sleep mode

FibroScan may not start after sleep mode because the time for booting the FibroScan is not enough. Do not use sleep mode when using FibroScan.

2.) Pointint cursor

Pointing cursor is available for only the following red area of the screen during FibroScan Mode.



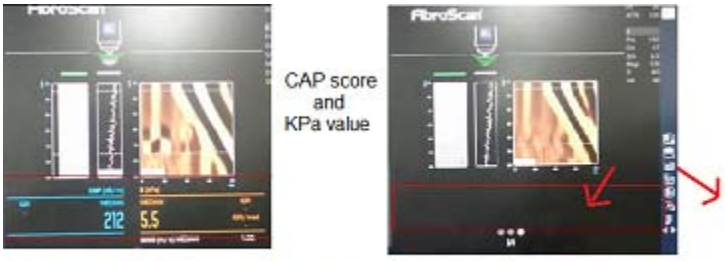
3.) Measurements in Report/Worksheet

Order of the measurements isn't equal between FibroScan Report and LS8 Report/Worksheet. However, measurements results are correct.

7-7-16-2 Issues

1.) CAP and KPa values occasionally not displayed.

At the 1st time of FibroScan mode after system starts, CAP score and Fibrosis KPa values occasionally not displayed.



Left: Correct case (displaying CAP score and KPa value)
Right: Defective case (no CAP score and KPa value)

<RECOVERY>

Once exit from FibroScan mode, and enter to FibroScan mode again.

2.) FibroScan Report and Probe button do not work properly

If FibroScan measurement and another function are performed at the same time, FibroScan functions occasionally do not work properly.

Example 1: If the button on the FibroScan probe is pressed while FibroScan Report is being generated, the button may not respond.

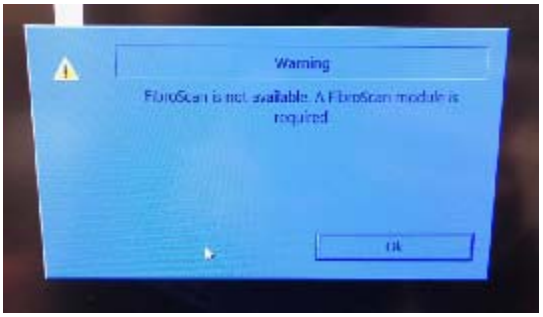
Example 2: Do not press the button on FibroScan probe, when FibroScan Report is selected and the system starts generating the report.

<WORKAROUND>

Do not press the button on FibroScan probe, when FibroScan Report is selected and the system starts generating the report.

3.) Error message: “FibroScan is not available. A FibroScan module is required”

The following error message may appear when starting FibroScan mode.



<RECOVERY>

Reboot the system.

7-7-17 Fibroscan Probe

Indicator of Fibroscan probe is blinking when select the probe in Fibroscan mode. It’s indicated the probe is active.

7-7-18 Privacy and Security Trouble Shooting

7-7-18-1 Password Policies

Trouble	Recovery/Workaround
Lost or forgot a password for a user.	If userdefs is backed up, restore the userdefs. If there is no backup, there is no workaround or recovery procedure. Need to create new user with a password
Entered wrong password and locked the user.	Wait until the user is unlocked. Then, enter right password.

7-7-18-2 Disk Encryption

Trouble	Recovery/Workaround
The system is accidentally turned off during the disk encryption is being configured.	Turn on the system. The disk encryption configuration will be continued.
Lost the USB key to unlock the disk encryption.	If a password to unlock the disk encryption is created, use the password. And then, create new USB key.
Formatted the USB key to unlock the disk encryption.	If a password to unlock the disk encryption is created, use the password. And then, create new USB key.
Lost the USB key and no password created.	There is no workaround or recovery procedures. Fully reload the Base Image and install the application. And then restore the database.

7-7-18-3 Virus Protection

Trouble	Recovery/Workaround
The system is accidentally turned off during the virus protection is being configured.	Turn on the system. The virus protection configuration will be restarted.
Without disabling the virus protection, software reload has been invoked.	You need to disable the virus protection first.
Without disabling the virus protection, software download has been initiated.	You need to disable the virus protection first.
Without disabling the virus protection, run a tool (script, executable, etc.) from USB memory stick, hard disk drive, etc.	The tool cannot be executed. You need to disable the virus protection first.

7-7-19 Slow response rate between the LOGIQ™ S8 and a DICOM (PACS) server

Problems with slow responses may result in images being re-sent automatically and low transfer rates. If you are experiencing problems with slow responses from a DICOM server, increase the timeout setting.

To adjust properties for a DICOM server (online):

1.) Navigate to **Utility** > **Connectivity** > **Service**.
2.) Select the service for the DICOM server.
3.) Under **Properties**, set **Timeout (sec)** to **360**.

7-7-20 When the touch panel does not response

From R4 system, the touch panel changes to electrostatic type. If the keys does not respond, clean the touch panel first. If the gel or somehting remains on the touch panel, it does not reposnd.

7-7-21 Limitation message during AFI Analysis

The limitaion message “Over Depth too high for analysis xx.xx cm, EXIT" displays when you measure AFI deeper than 20 cm. Measure whithin 20cm.

7-7-22 Noise Troubleshooting

7-7-22-1 Noise

Ultrasound machines are susceptible to Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transients in the air or wiring. They also generate EMI. Possible EMI sources should be identified before the unit is installed. Electrical and electronic equipment may produce EMI unintentionally as the result of a defect. Some of these sources include:

- medical lasers
- scanners
- cauterizing guns
- computers
- monitors
- fans
- gel warmers
- microwave ovens
- light dimmers
- portable phones

The presence of a broadcast station or broadcast van may also cause interference.

When talking to the customer, try to gather as much information as possible about the conditions when the noise appears.

Table 7-16 Noise Conditions

The noise is present	Determine	If the test fails, see...
All the time	n/a	*7-7-22-2 "Noise picked up from the air" on page 7-85* and *7-7-22-3 "Noise received through the external cables" on page 7-85*.
After some time of use	The amount of time between initial use and when the noise begins.	*7-7-22-2 "Noise picked up from the air" on page 7-85*.
CertaIn times of the day or night	The time of day or night along with the duration.	*7-7-22-2 "Noise picked up from the air" on page 7-85* and *7-7-22-3 "Noise received through the external cables" on page 7-85*.
At all locations in the hospital	n/a	*7-7-22-2 "Noise picked up from the air" on page 7-85*.
Only in one room or area	The room or area	*7-7-22-2 "Noise picked up from the air" on page 7-85* and *7-7-22-3 "Noise received through the external cables" on page 7-85*.
From time to time with no special pattern of time is observed	n/a	*7-7-22-2 "Noise picked up from the air" on page 7-85* and *7-7-22-3 "Noise received through the external cables" on page 7-85*.

7-7-22-2 Noise picked up from the air

Table 7-17 Noise Conditions Picked Up from the Air

Symptom	Cause	Solution
Noise is coherent -“penlight noise” pointing down in the picture due to the fact that the noise is received on all channels.	The electromagnetic interference (EMI) from radio frequencies, magnetic fields, and transients in the air.	Test whether the noise is picked up by a probe cable.
Noise is a problem on a single probe.		Test with another probe.
Noise is a problem on a single probe port.		Move the LOGIQ™ S8 to another location to see if the noise persists.

7-7-22-3 Noise received through the external cables

Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transients in the wiring. The noise can enter the system through the mains power cable, probe cable(s) or any other external connected cable(s).

Disconnect cables that are not needed for the basic use of the LOGIQ™ S8:

- Network cable
- Cables to any external peripherals
- ECG cables and other cables connected to the Patient I/O

Verify whether the noise changed or disappeared when the cables were removed.

Often, this type of noise is due to grounding problems in the mains power system or when the LOGIQ™ S8 is sharing a power line with other equipment.

7-7-22-4 Intermittent noise

Intermittent noise can be caused by other equipment.

Table 7-18 Noise Conditions for Intermittent

Symptom	Solution
Intermittent noise	Check equipment that is turned on and off near the scanner.
Intermittent noise present around the clock	Check the clock.
Intermittent noise present at certain times	Check equipment that is turned on and off near the scanner at certain times.

7-7-23 Electromagnetic Interference (EMI) Troubleshooting

7-7-23-1 Prevention/abatement

For EMI rules and details, see "EMI Limitations" on page 2-4.

7-7-23-2 Different power outlet

Connect the LOGIQ™ S8 to another power outlet and check to see if the noise changes or disappears.

NOTE: Image artifacts can occur if, at any time within the facility, the ground from the main facility's incoming power source to the LOGIQ™ S8 is only a conduit.
See "Minimal floor plan suggestions" on page 2-9.

7-7-23-3 Different system

Try another LOGIQ™ S8 at the same location and look for the same noise. If the noise is present on the new system too, the noise is most likely from an external source/equipment.

7-7-23-4 Different location

Move the LOGIQ™ S8 to another location and check to see if the noise changes or disappears. This may help to locate an external noise source.

Try to move the LOGIQ™ S8 to:

- another location inside the room
- another room
- another floor

7-7-23-5 Disconnect external cables

Disconnect all external cables (network, all unused probes, ECG leads, etc.) and check to see if the noise disappears.

7-7-24 Connectivity Troubleshooting

For information on connectivity setup, see *Section 3-8 "Setting Up Connectivity and Tips" on page 3-39*.

Table 7-19 Connectivity Conditions

Symptom	Cause	Solution
Cannot connect to PACS through the network	Network properties are not correct. Network card failure.	Open a command prompt. "Ping" and verify no lost packets. If there is an error, try to reimage.
		"Ping" IP address for the LOGIQ™ S8 (given by hospital or the listed default in manual) and verify no lost packets. If there is an error, replace the board.
		"Ping" gateway if given one and verify no lost packets. If there is an error, verify that network cable plugged in, and the network lights on the front are blinking. Double check subunit and gateway are correctly entered. This point and beyond are hospital issues.
		"Ping" another machine on the network and verify no lost packets. If there is an error, try pinging from another computer on the same network.
No ping through the network	Media type not set to Auto Select	Check the speed of your connection. Media type should be set for Auto Select. Remember that every time the system is re-ghosted that setting goes back to the default value.
	Hardware not connected properly	Check cables. You need a crossover cable if you are connected directly to the device. Use a straight cable whenever you go through a hub. The use of a hub is highly recommended. Try connecting the network cable directly to the Ethernet port in the board. If the connection works, troubleshoot the cabling to the external device.
	Incorrect address	Check proper addressing. The system should be under the same subnet or have a gateway address to be able to connect to another subnet.
	Network is down	Verify that the network is active and running.
		With your laptop check to see if you can ping the LOGIQ™ S8 and the device (Printer or PACs).
No verify for the DICOM server	Server does not support the DICOM service	Check if the device supports Verify.
	Port or AE title settings are not correct.	Check port and AE title info.
	Server is not running	Check if the device is up and running. It may be up but in an error status. Reboot the device if possible. You also may need to reboot the LOGIQ™ S8.
	Unknown	Use Network Capture. See "Network Capture" on page 7-61.

Table 7-19 Connectivity Conditions (Continued)

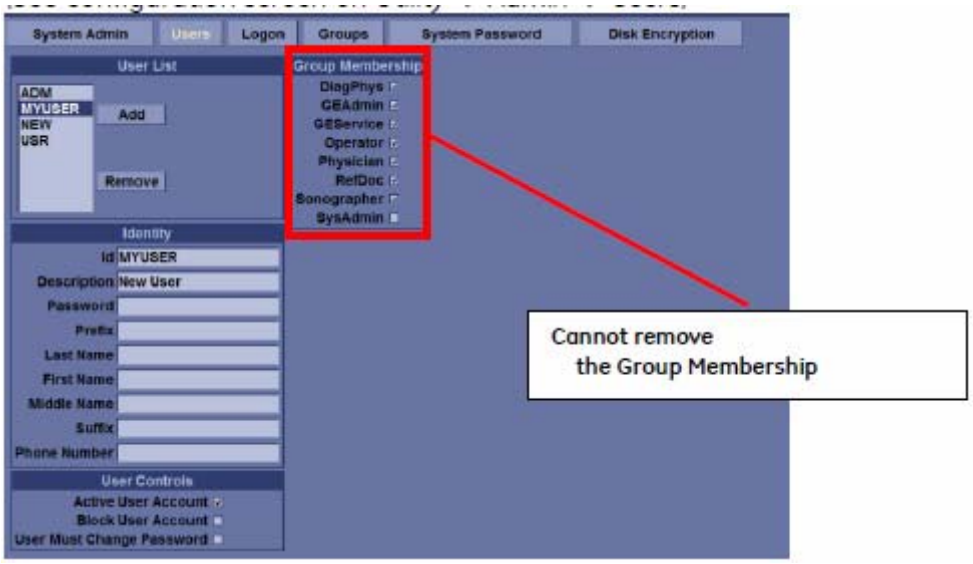
Symptom	Cause	Solution
System pings and verifies but there is a transfer failure from the LOGIQ™ S8 to the DICOM server	Slow response from the DICOM server	Check device configuration. Increase the time out properties.
	Large data sets	
	Server limitations	Check device configuration. Increase the number of parallel ports if possible.
	Problem with the spooler	Clean the spooler (F4).
	Problems with the Connectivity configuration	Check the Connectivity configuration on the LOGIQ™ S8. • If it is a printer, check that the printer supports the film type and format. Some printers do not support different image sizes (or different formats, such as the Patient entry screen). If this is the case, the spooler may show the job in a “Done” status but the images never get printed. Try sending secondary capture. • If it is a storage device, check whether the image type is supported (color, gray, Multiframe) • If it is a Worklist broker, use a Dataflow in which your Worklist is the primary input. Otherwise, it will not let you retrieve patients. Also, check your Worklist search criteria configuration.
	Unknown	Use Network Capture. See "Network Capture" on page 7-61.
Jobs exist on the spooler but do not display at destination (sometimes only on Cine or Secondary Capture)	Destination unable to view the particular photometric interpretation.	Check what compression and photometric interpretation the destination device supports and adjust (if possible) on the destination service to the settings, which results in successful viewing. Note that compression JPEG will give photometric interpretation YBR_FULL_422, RLE will give YBR_FULL and uncompressed will give RGB. The exception to this is if you enable B/W only, then you will get photometric interpretation MONOCHROME2 for all compressions.
Slow transfer between the LOGIQ™ S8 and DICOM server	Images being re-sent automatically and low transfer rates.	Adjust the retry settings to make jobs retry on bad networks. There is no need to set retries for mobile (off-line) use. Increase compression • Uncheck **Use Button Settings** • Set the **Max Framerate** to 25% • Set **Clip Quality** to 85%
Unchecking of DHCP does not stick on reboot		When selecting Static IP connectivity always enter Default Gateway. Otherwise the static IP settings will be erased on reboot
Frozen dual image with ECG graph stored as clip when printing and sending to PACS		Frozen dual image with ECG graph stored as clip when printing and sending to PACS.
It takes time to show patient list for DICOM Read and Import		When there are multiple patient files on a USB device, the system may take a longer than expected amount of time to display the patient list when reading and importing DICOM files.

7-7-25 User Group Management and User Right Control (For R4)

7-7-25-1 Cannot remove the Group Membership attribute

Affected version; R4

Issue; Once a Group membership attribute is added, the system does not allow you to remove it. You can uncheck the attribute and save, but when returning to the same page, the attribute remains checked. (See configuration screen on Utility -> Admin -> Users).



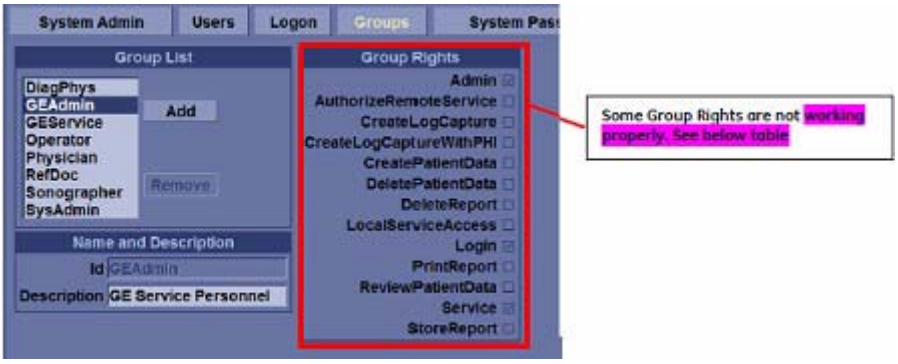
Workaround: Remove the user affected, then add the user again and then set up Group Membership attributes that you want.

7-7-25-2 The group right does not work properly

Affected version; R4

Issue: The group right does not work properly, even though checked/unchecked on Some Group Rights (See configuration screen on Utility -> Admin -> Groups).

Workaround: None



The table shows whether Group Rights work properly or not.

UI caption	Functionality	Work properly
Admin	Allow to access Admin configuration. Can access to Connectivity and Admin pages in Utility if user has this right.	Y
AuthorizeRemoteService	Allow remote service to connect to machine. But this right does not work. any user can access remote service. The check box has no effects.	N
CreateLogCapture	Allow to store log by Alt+D. Can access gathering log files dialog if user has this right.	Y
CreateLogCaptureWithPHI	Allow to choose PHI option on the log dialog. Can enable to gathering protected log files if user has this right.	Y
CreatePatientData	Allow to create patient exam. But this right does not work. any user can register new patient and create exams. The check box has no effects.	N
DeletePatientData	Allow to delete patient exam. Can remove patients and exams if user has this right.	Y
DeleteReport	Allow to delete report. But this right does not work. any user can remove reports. The check box has no effects.	N
LocalServiceAccess	Allow to Service browser access on machine. But this right does not work. the Service login does not depend with group right controls. The check box has no effects.	N
Login	Allow to login. But this right does not work. any user can login to system even if this right does not set. The check box has no effects.	N
PrintReport	Allow to print report. But this right does not work. any user can print reports. The check box has no effects.	N
ReviewPatientData	Allow to recall patient and exam. But this right does not work. any user can recall patients and review exams. The check box has no effects.	N
Service	Allow to access specialized service. But this right does not work. the Service login does not depend with group right controls. The check box has no effects.	N
StoreReport	Allow to store a report But this right does not work. any user can store reports. The check box has no effects.	N

Section 7-8
Error messages

Table 7-20: Error messages

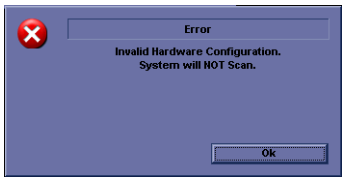
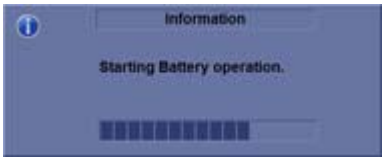
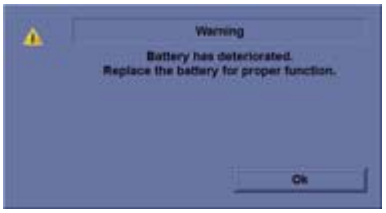
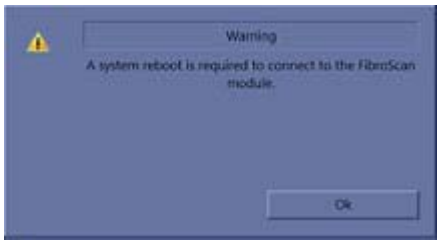
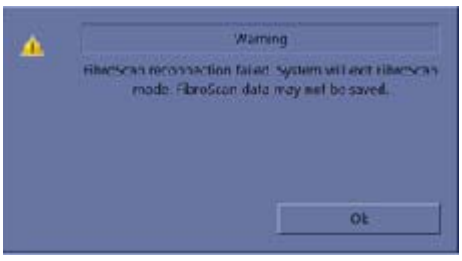
	The system has detected the lower air filter requires cleaning. Please clean the lower filter. 1. Shutdown the system. 2. Clean the air filter according to "How often should maintenance tasks be performed?" on page 9-3. Cause: CPU Temperature exceeded threshold (95°C).
	System temperature is too high. System will shut down. 1. Shutdown the system. 2. Clean the air filter according to "How often should maintenance tasks be performed?" on page 9-3. Cause: CPU Temperature exceeded threshold (100°C) and therefore, system must be shut down immediately.
	System voltage fault. System will shut down. 1. Select ***OK*** and reboot the system. 2. If the same message appears after reboot, shut down the system and turn off the breaker. Then turn on the system according to "Power On/Off" on page 3-17. Cause: Hardware and/or Voltage error detected.
	System Error. Please reboot the system. 1. Select ***OK*** and reboot the system. 2. If the same message appears after reboot, shut down the system and turn off the breaker. Then turn on the system according to "Power On/Off" on page 3-17. Cause: Unrecoverable error occurred and unable to continue scan.
	Invalid Hardware Configuration. System will not scan. 1. Select ***OK*** and reboot the system. 2. If the same message appears after reboot, shut down the system and turn off the breaker. Then turn on the system according to "Power On/Off" on page 3-17.
	Battery deterioration When the system detects the battery deterioration, the “Battery deterioration” dialog displays. Replace the battery for proper function.

Table 7-20: Error messages

	Information “Starting Battery Operation” Condition: After unplugged and waiting to enter battery power mode (3 seconds).
	Information “Running on Battery. Key operation locked.” Condition: Battery power mode (power saving, locked keys, etc.)
No message	Condition: Plugged.
	Warning “Battery has deteriorated. Replace the battery for proper function.” Condition: Battery has deteriorated. Shown periodically (14 days) on startup.
	Warning “Low Battery. System shutting down.” Condition: Shutdown due to low battery power.
	Warning “Error in Battery. System shutting down.” Condition: Shutdown due to battery error.
	Warning “Battery cannot be detected.” Condition: Shutdown due to battery error.

7-8-1 FibroScan Module Error messages and Logs

Table 7-21: Error messages and Logs

	Message: A system reboot is required to connect to the FibroScan module. The system has detected FibroScan Module connection is not available. Reboot the system. Cause: The network connection between FibroScan Module and the system was disconnected during FibroScan mode, and connection recovery failed.
	Message: FibroScan is not available. A FibroScan module is required The system could not detect FibroScan Module. Please check below steps: 1. FibroScan Module is mounted on the system 2. Green LED on FibroScan Module is ON 3. Blue LED on FibroScan Module is ON If either of above step is failed, go to trouble shooting. Cause: The system did not detect an established network connection between FibroScan Module and the system on boot up.
	Message: Shutting down FibroScan Module, please wait... The system will be shutting down in a moment. The system will shut down FibroScan Module safely before shutting down itself. The system will proceed on shut down after message disappears.
	Message: FibroScan connection is not available. Reconnecting... this could take up to 30 seconds. The system has detected FibroScan Module connection is not available. The system is trying to reconnect to FibroScan Module. Please simply wait for the reconnection process to end. The message will disappear if reconnection is successful. You could continue the FibroScan measurement if reconnection is successful. Cause: A network disconnection has occurred during FibroScan mode.
	Message: FibroScan reconnection failed. System will exit FibroScan mode. FibroScan data may not be saved. The system has detected FibroScan Module connection is not available, and reconnection process has failed. The system will force exit FibroScan mode without storing FibroScan measurement data. Cause: A network disconnection has occurred during FibroScan mode.

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Chapter 8
Renewal Parts

Section 8-1
Overview

8-1-1 Contents in this chapter

Section 8-2
Optional Peripherals and Accessories

8-2-1 Printers

Table 8-1 Optional Peripherals and Accessories - Printers

No.	Part Name	Part Number	Description	Qty
1.	Digital B/W Video Printer (Sony UP-D897)	5160458	Digital B/W Video Printer, USB-Port. 	-
2.	Digital B/W Video Printer (Sony UP-D898)	5599030	Digital B/W Video Printer, USB-Port. 	-
3.	Digital Color Printer (Sony UP-D25MD)	H44642LW	Digital Color Printer, USB-Port. 	-
4.	Digital Color Printer (Sony UP-DR80MD)	5555266	Digital Color Printer, USB-Port. 	-

Table 8-1 Optional Peripherals and Accessories - Printers

No.	Part Name	Part Number	Description	Qty
5.	HP OfficeJet PRO 8100 ePrinter	5716062		-
6.	HP OfficeJet PRO H8210	5763696		-

NOTE: The illustrations may not correspond to the actual product!

Section 8-3
Probes

Table 8-2 Probe Description

Part Number	Part Name	Illustration	Application	Feature	Description
5304539	C1-5-D		Abdomen, Vascular (No transcranial), OB/GYN, Urology	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, Contrast, Strain Elastography, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D, Volume Navigation, Biopsy	Non RoHS. Replaced by 5409287.
5409287					Non RoHS. Replaced by 5499513.
5499513					RoHS Compliant probe
5397669	3CRF-D		Abdomen	B, CHI, CF, PDI, M, PW, Contrast, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D, Volume Navigation, Biopsy	Non RoHS.
5499603					RoHS Compliant probe
5405254	C2-9-D		Abdomen, OB/GYN, Pediatric, Neonatal, Vascular (No transcranial)	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, Contrast, Strain Elastography, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced3D, Volume Navigation, Biopsy	Non RoHS.
5499605					RoHS Compliant probe
5488219	C2-9VN-D				
5476030/ 5476031 (Japan model)	10C-D		Pediatric, Neonatal, Vascular (No transcranial)	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced3D	
5476026/ 5476027 (Japan model)	C2-6b-D		Abdomen (Radio frequency Ablation (RFA), Biopsy)	B, CHI, CF, PDI, M, Anatomical M, PW, Contrast, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced3D, Volume Navigation, Biopsy	
5212417	IC5-9-D		OB, Urology	B, CHI, CF, PDI, M, Anatomical M, PW, Contrast, Strain Elastography, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D, Volume Navigation, Biopsy	Non RoHS. Replaced by 5499552.
5499592					RoHS Compliant probe
5212849	9L-D		Abdomen, Small Parts, Vascular (No transcranial), Pediatric, Neonatal, Breast, Musculoskeletal, OB	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, BF HD Color, Contrast, Strain Elastography, Shearwave Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D,Volume Navigation, Biopsy	Non RoHS. Replaced by 5499510.
5499510					RoHS Compliant probe

Table 8-2 Probe Description

Part Number	Part Name	Illustration	Application	Feature	Description
5410800	11L-D		Vascular (No transcranial), Small Parts, Pediatric, Neonatal, Breast, Musculoskeletal	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, Contrast, Strain Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced3D, Biopsy	
5271060	ML6-15-D		Small Parts, Vascular (No transcranial), Pediatric, Neonatal, Breast, Musculoskeletal	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, Contrast, Strain Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D, Volume Navigation, Biopsy	Non RoHS. Replaced by 5410769.
5410769					Non RoHS. Replaced by 5499600.
5499600					RoHS Compliant probe
5335525	L8-18i-D		Small Pars, Musculoskeletal, Intraoperative	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, BF HD Color, Contrast, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D, Volume Navigation	Non RoHS. Replaced by 5410798.
5410798					Non RoHS. Replaced by 5499594.
5499594					RoHS Compliant probe
GE-3MIX	M5S-D		Cardiac, Transcranial, Abdomen	B, CHI, CF, PDI, M, MCF, Anatomical M, PW, CW, TVI, TVD, B-Flow, B-Flow Color, Contrast, Virtual Convex, LOGIQView, ATO/ASO, Stress Echo, SRI-HD, Volume Navigation, Advanced 3D	
5446030	M5Sc-D		Cardiac, Transcranial, Abdomen	B, CHI, CF, PDI, M, MCF, Anatomical M, PW, CW, TVI, TVD, B-Flow, B-Flow Color, Contrast, Virtual Convex, LOGIQView, ATO/ASO, Stress Echo, SRI-HD, Volume Navigation, Advanced 3D	
5394466	6S-D		Cardiac, OB, Pediatrics, Neonatal	B, CHI, CF, PDI, M, MCF, Anatomical M, PW, CW, TVI, TVD, Virtual Convex, LOGIQView, ATO/ASO, SRIHD, Advanced3D	Non RoHS.
5499318					RoHS Compliant probe
5438302	S1-5-D		Abdomen, OB/GYN, Vascular (No transcranial)	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, Virtual Convex, LOGIQView, ATO/ASO, SRI-HD, Advanced3D, Volume Navigation, Biopsy	Non RoHS.
5438302-2					RoHS Compliant probe
5394804	S4-10-D		Transcranial	B, CHI, CF, PDI, M, MCF, Anatomical M, PW, CW, TVI, TVD, Virtual Convex, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D,Volume Navigation	Non RoHS.
5394804-2					RoHS Compliant probe

Table 8-2 Probe Description

Part Number	Part Name	Illustration	Application	Feature	Description
KTZ280168	3Sp-D		Cardiac, Transcranial, Abdomen	B, CHI, CF, PDI, M, MCF, Anatomical M, PW, CW, TVI, TVD, Virtual Convex, LOGIQView, ATO/ASO, Stress Echo, SRI-HD, Advanced3D	
KTZ302502	RAB6-D		OB/GYN, Abdomen, Pediatric	B, CHI, CF, PDI, M, Anatomical M, PW, Contrast, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced3D, 3D/4D, Biopsy	Non RoHS.
KTZ303986					RoHS Compliant probe
KTZ157043	RIC5-9-D		OB/GYN (Transvaginal), Urology (Transrectal)	B, CHI, CF, PDI, M, Anatomical M, PW, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced3D, 3D/4D, Biopsy	Non RoHS.
					RoHS Compliant probe
KN100104	6Tc-RS		Cardiac (Transesophageal)	B, CHI, CF, PDI, M, MCF, Anatomical M, PW, CW, TVI, TVD, Virtual Convex, ATO/ASO, SRI-HD Note: Need DLP2RN adapter to connect. Note: 6Tc-RS probe requires special handling. Refer to the TEE Probe User Manual enclosed with 6Tc-RS probe.	Non RoHS.
KN100106					RoHS Compliant probe
TE100024	P2D		Cardiac, Vascular	CW, ASO	
TQ100002	P6D		Cardiac, Vascular	CW, ASO	
5499606	C1-6-D		Abdomen, OB/GYN, Vascular (No transcranial)	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, BF HD Color, Contrast, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced3D, Strain Elastography, Shearwave Elastography, Volume Navigation, Biopsy	
5476279	C1-6VN-D				
5505700	C2-7-D		Abdomen	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, Contrast, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced3D, Volume Navigation, Biopsy	
5505702	C2-7-D-LC				LC = Long Cable
5505701	C2-7VN-D				

Table 8-2 Probe Description

Part Number	Part Name	Illustration	Application	Feature	Description
5493012	C3-10-D		Pediatric, Neonatal, Vascular (No transcranial)	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D, Volume Navigation	
5535371	BE9CS-D		Urology (Transrectal)	B, CHI, CF, PDI, M, Anatomical M, PW, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D, Biopsy, Strain Elastography	
5491310	L3-9i-D		Intraoperative	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, Contrast, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced3D	
5482856	L3-12-D		Vascular (No transcranial), OB, Small Parts, Breast, Musculoskeletal	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, BF HD Color, Contrast, Strain Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced3D, Biopsy	
KTZ157046	RSP6-16-D		Small Parts, Vascular (No transcranial), Breast, Musculoskeletal	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, Contrast, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced3D, 3D/4D, Biopsy	
5504447	P8D		Vascular (No transcranial)	CW, ASO	
5763787	FibroScan Probe M Plus FRU		FibroScan	FibroScan	
5763788	FibroScan Probe XL Plus FRU		FibroScan	FibroScan	

Section 8-4
Power Cord

Table 8-3 Power Cord

No.	Part Name	Part Number	Description	Qty
1.	Power Cord for India	5182611		1
2.	Power Cord for Switzerland	5182235		1
3.	Power Cord for UK/HK	5182816		1
4.	Power Cord for ANZ	5182296		1
5.	Power Cord for Denmark	5182083		1

Table 8-3 Power Cord

No.	Part Name	Part Number	Description	Qty
6.	Power Cord for Italy	5182940		1
7.	Power Cord for Argentina	5182942		1
8.	Power Cord for Israel	5182453		1
9.	Power Cord 110V for Canada/USA/ JPN	2388982	Power Cord 110V for Canada/USA/JPN Power Cord 200V for Thailand 	1
10.	Power Cord 220V for EU Replace with 6736105-3	2327990		1
11.	Power Cord for China	2388981		1

Table 8-3 Power Cord

No.	Part Name	Part Number	Description	Qty
12.	Power Cord for Canada/USA/ Japan Replace with 6736114-3 and 5669995	2388982		1
13.	Power Cord for Brazil	5399665		1
14.	Power Cord for South Africa	5408183		1
15.	Power Cord for Japan	5408490		1
16.	Power Cord for Taiwan	5792418		1
17.	Power Supply Cord EUROPE KOREA 10A 250V STRAIGHT 4M	6736105-7		1
18.	Power Supply Cord UNITED STATES - CANADA 15A 125V STRAIGHT 4M	6736114-3		1

Chapter 9
Care & Maintenance

Section 9-1
Overview

9-1-1 Periodic maintenance inspections

It has been determined by engineering that your LOGIQ S8 system does not have any high wear components that fail with use, therefore no Periodic Maintenance inspections are mandatory. Some Customers Quality Assurance Programs may require additional tasks and or inspections at a different frequency than listed in this manual.

9-1-2 Purpose of this chapter

This chapter describes **Care & Maintenance** on the scanner and peripherals. These procedures are intended to **maintain the quality** of the ultrasound **systems performance**. Read this chapter completely and familiarize yourself with the procedures before performing a task.

NOTE: When not otherwise specified, the contents of this manual and reference to LOGIQ S8 applies to all LOGIQ S8/LOGIQ E8/LOGIQ S8 Vet models.

9-1-3 Contents in this chapter

Section 9-2
Warnings

DANGER **THERE ARE SEVERAL PLACES ON THE BACKPLANE, THE AC DISTRIBUTION, AND DC DISTRIBUTION THAT ARE DANGEROUS. BE SURE TO DISCONNECT THE SYSTEM POWER PLUG AND OPEN THE MAIN CIRCUIT BREAKER BEFORE YOU REMOVE ANY PARTS. BE CAUTIOUS WHENEVER POWER IS STILL ON AND COVERS ARE REMOVED.**

CAUTION **PRACTICE GOOD ESD PREVENTION. WEAR AN ANTI–STATIC STRAP WHEN HANDLING ELECTRONIC PARTS AND EVEN WHEN DISCONNECTING/CONNECTING CABLES.**

CAUTION **DO NOT PULL OUT OR INSERT CIRCUIT BOARDS WHILE POWER IS ON.**

CAUTION **DO NOT OPERATE THIS UNIT UNLESS ALL BOARD COVERS AND FRAME PANELS ARE SECURELY IN PLACE. SYSTEM PERFORMANCE AND COOLING REQUIRE THIS.**

Section 9-3
Why do maintenance

9-3-1 Keeping records

It is good business practice that ultrasound facilities maintain records of periodic and corrective maintenance. The Ultrasound Periodic Maintenance Inspection Certificate provides the customer with documentation that the ultrasound scanner is maintained on a periodic basis.

A copy of the Ultrasound Periodic Maintenance Inspection Certificate should be kept in the same room or near the scanner.

9-3-2 Quality assurance

In order to gain accreditation from organizations such as the American College of Radiology (USA), it is the customer’s responsibility to have a quality assurance program in place for each scanner. The program must be directed by a medical physicists, the supervising radiologist/physician or appropriate designee.

Routine quality control testing must occur regularly. The same tests are performed during each period so that changes can be monitored over time and effective corrective action can be taken.

Testing results, corrective action and the effects of corrective action must be documented and maintained on the site.

Your GE service representative can help you with establishing, performing and maintaining records for a quality assurance program. Please contact us for coverage and/or price for service.

Section 9-4
Maintenance task schedule

9-4-1 How often should maintenance tasks be performed?

The Care & Maintenance task schedule (Table 9-1 below) specifies how often your LOGIQ™ S8 should be serviced and outlines items requiring special attention.

NOTE: It is the customer's responsibility to ensure the LOGIQ™ S8 care & maintenance is performed as scheduled in order to retain its high level of safety, dependability and performance.

Your GE Service Representative has an in-depth knowledge of your LOGIQ™ S8 ultrasound scanning system and can best provide competent, efficient service. Please contact us for coverage information and/or price for service.

The service procedures and recommended intervals shown in the Care & Maintenance Task Schedule assumes that you use your LOGIQ™ S8 for an average patient load (10-12 per day) and not use it as a primary mobile unit which is transported between diagnostic facilities.

NOTE: If conditions exist which exceed typical usage and patient load, then it is recommended to increase the periodic maintenance frequencies.

Abbreviations used in the Customer Care Schedule 9-1:

D = Daily W = Weekly M = Monthly A = Annually

Table 9-1 Customer Care Schedule

Item	Service at Indicated Time	D	W	M	A	Notes
Air Filter Grid	Remove the filter grid and clean the air filter.		•			Recommend to clean filter at least bi-weekly
AC Mains Cable	Inspect AC Mains Cable			•		Mobile Unit Check weekly
Cables and Connectors	Check if all cables are fixed well seated at the correct position and if there is no mechanical damage visible.				•	also after corrective maintenance
User Interface	Clean alphanumerical keyboard, Functional keys, Digital potentiometers, TGC-Shift potentiometers. (vacuum cleaner, lukewarm soap water on a soft, damp cloth)		•			Be careful not to get the cloth too wet so that moisture does not enter the loudspeakers, TGC-Slider, or other keys!
LCD Monitor, Touch Panel and Probe holder	Clean LCD Monitor surface and Probe holder with a fluid detergent in warm water on a soft, damp cloth.		•			Be careful not to get the cloth too wet so that moisture does not enter the entire system.
Mechanical parts	Clean and inspect the mechanical function of wheels, casters, brakes and swivel locks as well as side door, foot rest, front and rear handle, and monitor holder. Remove Dust and Coupling gel.			•		Mobile Unit Check Daily
Control Console movement	Check Translation/Rotation and Height Adjustment (Elevation)				•	more frequently at Mobile Units
Trackball Check	Check proper operation (Cursor movement X, Y direction)	•				If failure occurs go to trackball cleaning.

Table 9-1 Customer Care Schedule

Item	Service at Indicated Time	D	W	M	A	Notes
Trackball Cleaning	Remove trackball ring; open the trackball housing and take out the trackball to clean it with soft tissue and screwdriver shaft.				•	Please record it in the systems setup maintenance report
Disk Drives (Data Backup)	Test Image filing (Archive) Import and Export data capability (DVD/CD Drive)		•	•*		* save the image filing data weekly or at least monthly on DVD/CD depending on the number of examinations
Safe Probe Operation	Clean probes and probe cables and check acoustic lens housing (cracks) and probe cables. In case of mechanical damage, don't use them! **Danger:** Safety risk for operator and patient.	•*				* or before each use
Probe Air bubbles	To detect air bubbles in filling liquid, shake the probe carefully and check abnormal noise.					
Probe connectors	Remove dust/dirt of all probe connectors. Clean with vacuum cleaner if dust is visible.			•		
Console Leakage Current Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Peripheral Leakage Current Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Surface Probe Leakage Current Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Endocavity Probe Leakage Current Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Measurement Accuracy Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Probe/Phantom Checks	Check axial and lateral resolution (see Basic User Manual Technical specifications). Check Gain and TGC changes, vary the focus and check reaction on screen. Check deviation of brightness in the US-Image (missing elements / probe cable defect). Probe must be coupled as this test.				•	Also after corrective maintenance or as required by your facilities QA program.
Functional Checks of all probes section 9-6-2 on page 9-8	Check general functions and image appearance at human body with all available Modes.				•	Also after corrective maintenance or as required by your facilities QA program.

Table 9-1 Customer Care Schedule

Item	Service at Indicated Time	D	W	M	A	Notes
Battery	Battery deterioration When the system detects the battery deterioration, the “Battery deterioration” dialog displays. Replace the battery for proper function.				•	When “Battery deterioration” message will be displayed, call to GE Service.
Battery Refresh	If the user doesn’t maintain the battery as indicated in Basic User Manual Chapter 3 “Refreshing battery”, refresh the battery every 6 months for the user. Refresh procedure: 1. Turn on the system. 2. Wait until the battery is fully charged. it takes at least 1 hour to fully charge the battery. 3. Turn off the system. 4. Remove all probes. 5. Turn on the system. 6. Unplug the AC cable and wait until the system shuts down. It may take 30 minutes or more to complete shutdown. 7. Wait at least 5 hours. 8. Plug in the AC cable. 9. Turn on the system. 10. Wait until the battery is fully charged. It takes about 3 hours to fully charge the battery.				•	Every 6 months

Section 9-5
Tools required

9-5-1 Special tools, supplies and equipment

Also refer to 8-2-6 "Tools needed for servicing LOGIQ S8/LOGIQ E8" on page 8-5.

Table 9-2 Overview of requirements for periodic maintenance

Tool	Comments
Digital Volt Meter (DVM)	
Anti Static Kit	Typically includes antistatic-mat, wrist strap and ground cable.
Anti Static Vacuum Cleaner	If available on site.
Safety Analyzer	Any calibrated Electrical Safety Analyzer compliant with AAMI/ESI 1993 or IEC 60601 or AS/NZS 3551
Phantom	If available on site.
CD-R/DVD-R Media	
DVD+RW Disc Media blank	
B/W Printer Cleaning Sheet	see printer user manual for requirements
Color Printer Cleaning Sheet	see printer user manual for requirements
Disposable Gloves	

Section 9-6
System maintenance

9-6-1 Preliminary checks

The preliminary checks take about 15 minutes to perform. Refer to the system user documentation whenever necessary.

Table 9-3 System checks

Step	Item	Description
1	Ask & Listen	Ask the customer if they have any problems or questions about the equipment.
2	Paperwork	Fill in the top of the Ultrasound Inspection Certificate (see: "Ultrasound INSPECTION CERTIFICATE" on page 9-37). Note all probes and system options.
3	Power up	Turn the system power on and verify that all fans and peripherals turn on. Watch the displays during power up to verify that no warning or error messages are displayed.
4	Probes	Verify that the system properly recognizes all probes.
5	Displays	Verify proper display on the LCD monitor and Touch Panel.
6	Presets	“Full Backup” all customer presets on Hard disk and/or DVD (see: Section 8-7 "Settings - Backup and Restore" on page 8-83).
7	Image Archive	Backup the Image Archive on DVD-R, CD-R, USB drives, etc. (see: Section 8-7 "Settings - Backup and Restore" on page 8-83).

9-6-2 Functional checks

The functional checks take about 60 minutes to perform. Refer to the Basic User Manual whenever necessary.

9-6-2-1 System functional checks

Table 9-4 System Functional Checks

Check	Step	Description
1	B Mode	Verify basic B-Mode (2D) operation. Check the basic Ultrasound system controls that affect this mode of operation.
2	Color Flow Mode	Verify basic CF-Mode (Color Flow Mode) operation. Check the basic Ultrasound system controls that affect this mode of operation.
3	Doppler Mode	Where applicable, verify basic Doppler operation (PW and CW if available). Check the basic Ultrasound system controls that affect this mode of operation.
4	M-Mode	Verify basic M-Mode operation. Check the basic Ultrasound system controls that affect this mode of operation.
5	3D Mode	Where applicable, verify basic 3D Mode operation. Check the basic system controls that affect this mode of operation.
6	Real Time 4D Mode	Where applicable, verify basic Real Time 4D Mode operation. Check the basic system controls that affect this mode of operation.
7	Basic Measurements	Check Distance and Tissue Depth Measurement.
8	Probe Elements	Perform an Element Test on each probe to verify that all the probe elements and Ultrasound system channels are functional, where applicable.
9	Applicable Software Options	Verify the basic operation of all optional modes. Check the basic system controls that affect each options operation.
10	System Diagnostic	Perform the Automatic Tests, where applicable.
11	Transmit/Receive	Verify that all system XMIT/RECV channels are functional, where applicable.
12	Operating Panel test	Perform the Operating Panel Test Procedure.
13	Keyboard	Where applicable, verify basic keyboard functions (for example: type annotation, press F1 to display on online help.).
14	Touch Panel	Where applicable, verify basic Touch Panel display functions.
15	Monitor	Verify basic monitor display functions

*NOTE: * Some software may be considered standard depending upon system model configuration.*

9-6-2-2 Peripheral/Option Checks

If any peripherals or options are not part of the system configuration, the check can be omitted. Refer to Section 5-8 "Regional and Peripheral Options" on page 5-25 for a list of approved peripherals.

Table 9-5 GE approved Peripheral/Hardware Option Functional Checks

Step	Item	Description
1	B/W Printer	Verify hardcopy output of the B/W video page printer. Clean heads and covers if necessary.
2	Color Printer	Verify hardcopy output of the Color video page printer. Clean heads and covers if necessary.
3	Media	Verify hardcopy output of the Deskjet (Bluetooth) printer. Clean heads and covers if necessary.
4	DVR	Verify record/playback capabilities of the DVR.
5	DICOM	Verify that DICOM is functioning properly. Send an image to a DICOM device.
6	Footswitch	Verify that the footswitch is functioning as programed. Clean as necessary.
7	DVD-Drive	Verify that the DVD-drive reads/writes properly (export/recall image in Image Management System = Archive)

9-6-2-3 Mains Cable Inspection

Table 9-6 Mains Cable Inspection, as appropriate

Step	Item	Description
1	Unplug Cord	Disconnect the mains cable from the wall and system.
2	Inspect	Inspect it and its connectors for damage of any kind.
3	Terminals	Verify that the LINE, NEUTRAL and GROUND wires are properly attached to the terminals, and that no strands may cause a short circuit.
4	Inlet Connector	Inlet connector retainer is functional.

9-6-2-4 Optional diagnostic checks

To complete the Ultrasound system checks, view the error logs and run desired diagnostics.

9-6-2-5 View the logs

1.) Review the Ultrasound system error log for any problems.
2.) Check the temperature log to see if there are any trends that could cause problems in the future.

9-6-3 Cleaning

9-6-3-1 General Cleaning

Frequent and diligent cleaning of the LOGIQ™ S8 reduces the risk of spreading infection from person to person, and also helps to maintain a clean work environment.

Table 9-7 General Cleaning

Step	Item	Description
1	Console	Use a fluid detergent in warm water on a soft, damp cloth to carefully wipe the entire system. Be careful not to get the cloth too wet so that moisture does not enter the console. **Caution:** DO NOT allow any liquid to drip or seep into the system.
2	Monitor	Clean the monitor surface with a fluid detergent in warm water on a soft, damp cloth. **Caution:** DO NOT spray any liquid directly onto the LOGIQ™ S8 covers, monitor, keyboard, etc.

9-6-3-2 Appropriate Cleaning/Disinfectant Agents

Table 9-8: Appropriate Cleaning/Disinfectant Agents

Cleaning/ Disinfectant Agent	Monitor (Glass)	Monitor Frame (Panel)	System Cabinet	Measurement Selection Menu	Operator Controls
Mild, Non-Abrasive Soap and Water	OK	OK	OK	OK	OK
Ammonia	N/A	OK	N/A	N/A	N/A
<Disinfectant> Bleach (10 to 1 Ratio of 5% Home Bleach)	N/A	OK	N/A	N/A	OK
<Cleaner/ disinfectant> Hydrogen Peroxide / Hydrogen Peroxide Wipes	N/A	OK	N/A	N/A	N/A
Other recommended Cleaner/ Disinfectants	N/A	N/A	N/A	N/A	PDI - Super Sani Cloth Clorox - Multi Surface Wipes Hartmann - Kohrsolin Extra Hartmann - Kohrsolin FF
Notes	Never use thinner, benzene, alcohol (ethanol, methanol, or isopropyl alcohol), abrasive cleaners, or other string solvents, as these may cause damage to the monitor.		Cloth should be damp, not dripping wet.	Cloth should be damp, not dripping wet.	DO NOT USE: Any cleaning/ disinfecting solution BESIDES recommended cleaner.

OK = Available agent

N/A = Not Available

9-6-3-3 Air filter cleaning

Clean the system's air filters to ensure that a clogged filter does not cause the system to overheat and reduce system performance and reliability. It is recommended the filters be cleaned every two weeks, but the requirements will vary with environment.

CAUTION **Be sure to lock the wheels before cleaning the air filters to avoid injury by any unexpected movement of the system.**

DO NOT operate the unit without the air filters in place.

Allow the air filters to dry thoroughly before re-installing them on the unit.

Plastic Air filter

1.) Pull the front cover of cabinet with hand and pull out the air filter.

Figure 9-1 Air filter location

2.) Dust the filter with a vacuum cleaner and/or wash it with a mild soapy solution. If washed, rinse and dry the filter before re-installation.

3.) Put back the air filter and the front cover.

Metal Air filter

1.) Pull the front cover of cabinet.

Figure 9-2 Remove the front cover

2.) Pull out the air filter with the frame.

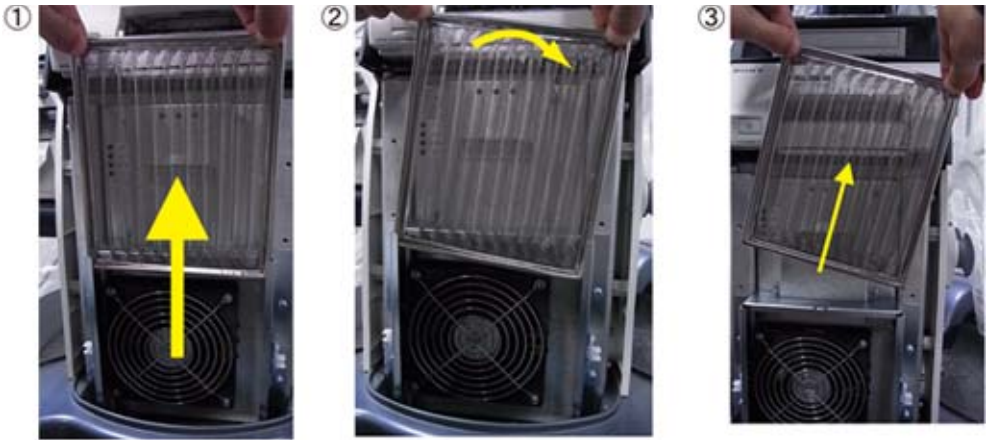


Figure 9-3 Remove the air filter

3.) Dust the filter with a vacuum cleaner and/or wash it with a mild soapy solution. If washed, rinse and dry the filter before re-installation.

4.) Put back the air filter with both hands and the front cover.

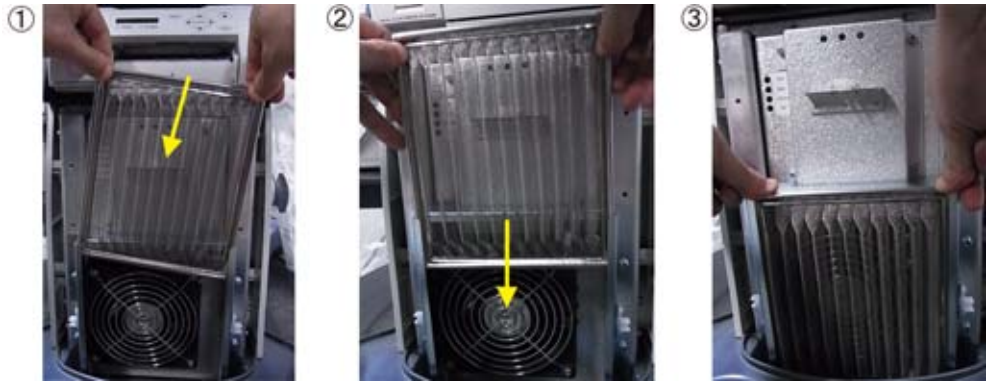


Figure 9-4 Put back the air filter

NOTE: For your convenience or if the air filter is too dirty, replacement filters are available. Refer to Chapter 9 for the air filter replacement part number.

9-6-4 Physical inspection

Table 9-9 Physical Checks

Step	Item	Description
1	Labeling	Verify that all system labeling is present and in readable condition.
2	Scratches & Dents	Inspect the console for dents, scratches or cracks.
3	LCD Monitor Display	Inspect the LCD Monitor Display for scratches and raster burns. Verify proper operation of Contrast and Brightness controls.
4	Control Panel and Keyboard	Inspect the Control Panel and Keyboard. Note any damaged or missing items. (Replace faulty components, as required). Verify proper operation of Control Panel backlighting and TGC sliders.
5	DVD Drive	Clean the drive head and media with the vendor-supplied cleaning kit. Advise the user to repeat this often, to prevent future problems. DVDs/CDs must be stored away from dust and cigarette smoke. Do not use alcohol or benzene to clean the drive
6	Wheels & Brakes	Check all wheels and casters for wear and verify operation of foot brake, to stop the unit from moving, and release mechanism. Check all wheel locks and swivel locks for proper operation.
7	Cables & Connectors	Check all internal cable harnesses and connectors for wear and secure connector seating. Pay special attention to footswitch assembly and probe strain or bend reliefs.
8	Power Cord	Check the power cord for cuts, loose hardware, tire marks, exposed insulation or other deterioration, and verify continuity. Tighten the clamps that secure the power cord to the unit and the outlet plug to the cord.
9	Shielding & Covers	Check to ensure that all EMI shielding, internal covers, air flow panels and screws are in place. Missing covers and hardware could cause EMI/RFI problems during scanning.
10	Peripherals	Check and clean the peripherals according to the manufacturer's directions. To prevent EMI or system overheating, dress the peripheral cables inside the peripheral cover.
11	External I/O	Check all connectors for damage and verify that the labeling is good.
12	OP Lights	Check proper operation of all control panel key illuminations (flash once during system start-up).

9-6-5 Probe maintenance

9-6-5-1 Probe related checks

Table 9-10 Probe Related Checks

Step	Item	Description
1	Probes	Thoroughly check the system probe connectors and remove dust from inside the connector sockets if necessary. Visually check for bent, damaged or missing pins.
2	Probe Holder	Clean probe holders (they may need to be soaked to remove excess gel).

9-6-5-2 Basic probe care

CAUTION **FibroScan probe does not have resistance to water. DO NOT immerse FibroScan probe into any liquid**

The Basic User Manual and/or care card provides a complete description of probe care, maintenance, cleaning and disinfection. Ensure that you are completely familiar with the proper care of GE probes.

Ultrasound probes can be easily damaged by improper handling. Review the Basic User Manual of LOGIQ™ S8 for more details. Failure to follow these precautions can result in serious injury and equipment damage. Failure to properly handle or maintain a probe may also void its warranty.

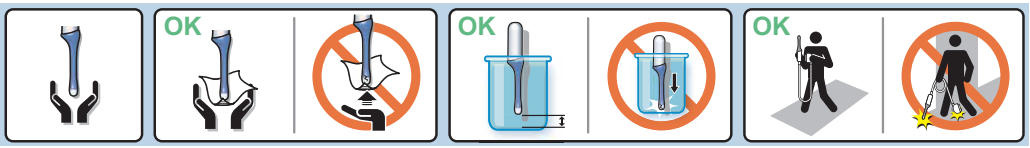


Figure 9-5 Probe handling icons

Any evidence of wear indicates the probe cannot be used.

Do a visual check of the probe pins and system sockets before plugging in a probe.

9-6-5-3 Basic Probe Cleaning and/or Disinfection

Refer to the Basic User Manual of LOGIQ™ S8 for details on cleaning.

CAUTION **Failure to follow the prescribed cleaning or disinfection procedures will void the probe's warranty. DO NOT soak or wipe the lens with any product not listed in the LOGIQ™ S8 Basic User Manual and/or care card. Doing so could result in irreparable damage to the probe and/or LOGIQ™ S8 system.**

CAUTION **Follow the Care Card instructions supplied with each probe (inside the transducer boxes) for disinfectants and gels that are compatible with the surface material of the probes.**

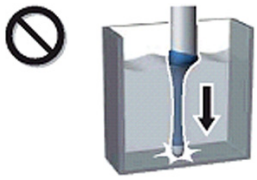
CAUTION **To help protect yourself from blood borne diseases, when cleaning and handling probes, wear approved, non-allergenic disposable gloves.**

NOTICE Disinfect a defective probe before you return it. Be sure to tag the probe as being disinfected.

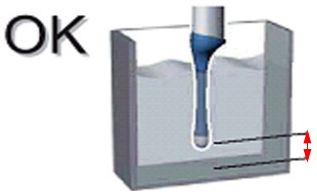
CAUTION

Please be aware of the sensitive probe head.

TAKE EXTREME CARE!



NEVER place or store a probe on its scan head!



When disinfecting a probe, ensure that there is sufficient space between the probe and the container bottom!

CAUTION **FibroScan probe does not have resistance to water. DO NOT immerse FibroScan probe into any liquid**

Section 9-7
Using a Phantom

The Use of a Phantom is not required during Preventive Maintenance. Customer may use it as part of their Quality Assurance Program tests.

Refer to the Phantoms User Manual for information on how to use it.

Section 9-8
Electrical Safety Tests

9-8-1 Safety test overview

WARNING ***To minimize risk of electric shock, only trained persons are allowed to perform the electrical safety inspections and tests.***

CAUTION **To avoid electrical shock, the Ultrasound system under test MUST NOT be connected to other electrical equipment. Remove all interconnecting cables and wires. The Ultrasound system under test must not be contacted by users or patients while performing these tests.**

CAUTION **Possible risk of infection. Do not handle soiled or contaminated probes and other components that have been in patient contact. Follow appropriate cleaning and disinfecting procedures before handling the equipment.**

The electrical safety tests in this section are based on NFPA 99 Standard for Health Care Facilities and IEC 62353 Medical electrical equipment – Recurrent test and test after repair of medical electrical equipment. These standards provide guidance on evaluating electrical safety of medical devices which are placed into service and are intended for use in planned maintenance (PM) or testing following service or repair activities. They differ somewhat from the standards that are used for design verification and manufacturing tests (e.g., IEC 60601-1 and UL 60601-1) which require a controlled test environment and can place unnecessary stress on the Ultrasound system.

These tests may refer to particular safety analyzer equipment as an example. Always consult the manufacturer's user manual of the Safety Analyzer that will be used to perform the tests.

Prior to initiating any electrical test, the Ultrasound system must be visually inspected. Perform the following visual checks:

- Check for missing or loose enclosure covers that could allow access to internal live parts.
- Examine the mains cord, mains plug and appliance inlet for damaged insulation and adequacy of strain relief and cable clamps.
- Locate and examine all associated transducers. Inspect the cables and strain relief at each end. Inspect the transducer enclosure and lens for cracks, holes and similar defects.

Equipment users must ensure that safety inspections are performed whenever damage is suspected and on a regular basis in accordance with local authorities and facility procedures. Do not use the Ultrasound system or individual probes which fail any portion of the safety test.

NOTE: For all instructions in the "Electrical safety tests" section in case of using a UPS (uninterruptible power supply) the terms outlet, wall outlet, AC wall outlet and power outlet refer to the AC power outlet of the UPS. In case of further available AC (or DC) power outlets at the same used UPS, these must remain unused i.e. not connected to any other devices.

9-8-2 GEHC Leakage Current Limits

CAUTION **Compare all safety-test results with safety-test results of previously performed safety tests (e.g. last year etc). In case of unexplainable abrupt changes of safety-test results consult experienced authorized service personnel or GE for further analysis.**

In accordance with these standards, fault conditions like Reverse Polarity of the supply mains and Open Neutral are no longer required for field evaluation of leakage current. Because the main source of leakage current is the mains supply, there are different acceptance limits depending on the configuration of the mains (100-120 or 220-240).

Table 9-11 Leakage current limits for Ultrasound system operation on 100-120 Volt mains (US/Canada/Japan)

Leakage Current Test	System Power	Lift Ground/ PE Conductor	Limit µA
Chassis/Enclosure Leakage	On and Off	Open	300
Type B/BF Applied Parts	On (transmit)	Closed Open	100 500
Type CF Applied Parts	On (transmit)	Closed Open	10 50
Type BF Applied Parts (sink leakage)	On and Off	Closed	5000
Type CF Applied Parts (sink leakage)	On and Off	Closed	50

Table 9-12 Leakage current limits for Ultrasound system operation on 220-240 Volt mains

Leakage Current Test	System Power	Lift Ground/ PE Conductor	Limit µA
Chassis/Enclosure Leakages	On	Open and Closed	500
Type B/BF Applied Parts	On (transmit)	Open	500
Type CF Applied Parts	On (transmit)	Open	50
Type BF Applied Parts (sink leakage)	On and Off	Closed	5000
Type CF Applied Parts (sink leakage)	On and Off	Closed	50

9-8-2 GEHC Leakage Current Limits (cont'd)

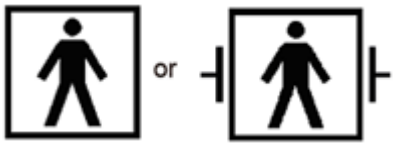
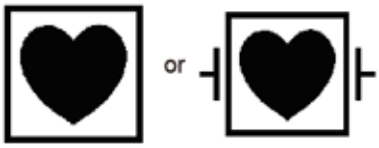
Table 9-13 ISO (on Dale 600) and Mains Applied (on Dale 601) Limits *

Probe Type	Measurement
BF	1000 µA
CF	50 µA

*ISO (on Dale 600) and Mains Applied (on Dale 601) refer to the sink leakage test where mains (supply) voltage is applied to the part to determine the amount of current that will pass (or sink) to ground if a patient contacted mains voltage.

NOTE: No need this test for Type B.

Table 9-14 Equipment Type and Test Definitions

Applied Parts (AP)	Parts or accessories that contact the patient to perform their function. For ultrasound equipment, this includes transducers, ECG leads, and e-TRAX Needle Sensor.	
Type BF or Defibrillation-proof Type BF	Body Floating or non-conductive ultrasound probes which are marked with the 'man in box' BF symbol. this includes all transducers and ECG leads.	
Type CF or Defibrillation-proof Type CF	Cardiac Floating or non-conductive intraoperative probes for direct cardiac contact and e-TRAX Needle Sensor which are marked with the 'heart in box' CF symbol.	
Type B	Ultrasound probes which are marked with the "man" B symbol. This includes FibroScan probes.	

9-8-3 Outlet Test - Wiring Arrangement - USA & Canada

Test all outlets in the area for proper grounding and wiring arrangement by plugging in the neon outlet tester and noting the combination of lights that are illuminated. Any problems found should be reported to the hospital immediately and the receptacle should not be used.

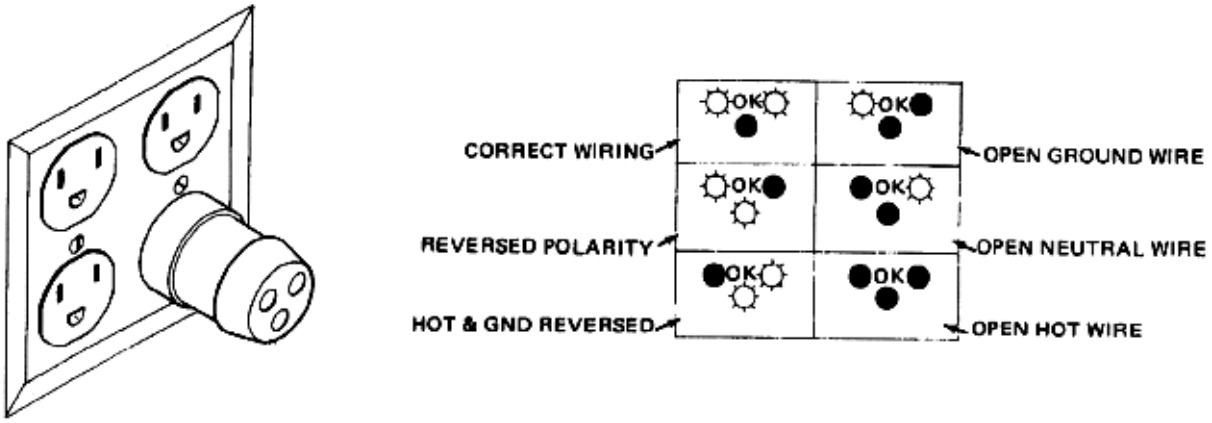


Figure 9-6 Typical Alternate Outlet Tester

NOTE: No outlet tester can detect the condition where the Neutral (grounded supply) conductor and the Grounding (protective earth) conductor are reversed. If later tests indicate high leakage currents, this should be suspected as a possible cause and the outlet wiring should be visually inspected.

9-8-4 Grounding Continuity

CAUTION **Electric Shock Hazard. The patient must not be contacted to the equipment during this test**

Measure the resistance from the third pin of the attachment plug to the exposed protectively - earthed metal parts of the case. The ground wire resistance should be less than **0.2** ohms.
Reference the procedure in the IEC60601-1.

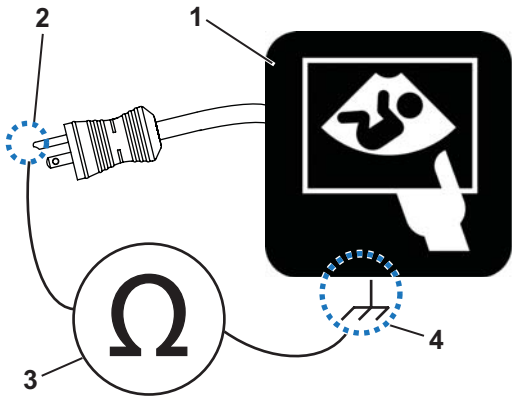


Figure 9-7 Ground Continuity Test

1.	Ultrasound System	**3.**	Ohmmeter
2.	Ground Pin	**4.**	Accessible Metal Parts (chassis - non-earth ground, unprotected surface)

NOTE: The Safety Analyzer can also be used instead of Ohmmeter. Refer to the manufacturer's user manual of the Safety Analyzer.

9-8-5 Chassis leakage current test

CAUTION **Electric Shock Hazard. When the meter's ground switch is OPEN, don't touch the Ultrasound system!**

CAUTION **Equipment damage possibility. Never switch the Polarity and the status of Neutral when the Ultrasound system is powered ON. Be sure to turn the Ultrasound system power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the Ultrasound system may be damaged.**

9-8-5-1 Definition

Also known as Enclosure Leakage current test, this test measures the current that would flow through a grounded person who touches the accessible conductive parts of the equipment during normal and fault conditions.

The test verifies the isolation of the power line from the chassis. The testing meter is connected to parts of the equipment, easily contacted by the user or patient.

Measurements should be made under the test conditions specified in:

- 9-11 on page 9-18, or
- 9-12 on page 9-18 as applicable.

Record the highest reading.

9-8-5-2 Generic Procedure

The test verifies the isolation of the power line from the chassis.

The testing meter is connected from accessible metal parts of the case to ground.

Measurements should be made under the test conditions specified in:

- 9-11 on page 9-18, or
- 9-12 on page 9-18 as applicable.

Record the highest reading.

1.) Connect Safety analyzer to wall AC power outlet.
2.) Plug the equipment under test power cable into the receptacle on the panel of the meter.
3.) Connect the meter to an accessible metal surface of the scanner using the cable provided with the meter.
4.) Select the Chassis or Enclosure leakage function on the meter.

NOTE: Consult the manufacturer's user manual of the Safety Analyzer.

5.) Test opening and closing the ground with the scanner on and off as indicated in 9-11 or 9-12 as applicable.

NOTE: Consult the manufacturer's user manual of the Safety Analyzer that will be used to perform the tests. The maximum allowable limit for chassis source leakage is shown in:

- 9-11 on page 9-18, or
- 9-12 on page 9-18 as Chassis/Enclosure Leakage.

9-8-6 Data sheet for enclosure/chassis leakage current

Table 9-15 below shows a typical format for recording the enclosure/chassis leakage current.

Measurements should be recorded from multiple locations for each set of test conditions.

The actual location of the test probe may vary by Ultrasound system.

NOTE: Record all data in the Electrical safety tests log.

Table 9-15 Typical data format for recording enclosure/chassis leakage

Unit under test_____ Date of test:_____					
Test Conditions		**Measurement/Test Point Location**			
System Power	**Grounding/PE**	**Rear Panel**	**Lower Frame**	**Probe Connector**	**Main Handle**
Off	Closed				
Off	Open				
On	Closed				
On	Open				

NOTE: Values in italics font are given as examples only.

9-8-7 Isolated patient lead (source) leakage-lead to ground

CAUTION **Equipment damage possibility. Never switch the Polarity and the status of Neutral when the system is powered ON. Be sure to turn the system power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the system may be damaged.**

9-8-7-1 Definition

This test measures the current which would flow to ground from any of the isolated ECG leads. The meter simulates a patient who is connected to the monitoring equipment and is grounded by touching some other grounded surface.

Measurements should be made under the test conditions specified in:

- 9-11 on page 9-18, or
- 9-12 on page 9-18 as applicable.

For each combination the operating controls, such as the lead switch, should be operated to find the worst case condition.

9-8-7-2 Generic Procedure

1.) Connect Safety analyzer to wall AC power outlet.
2.) Plug the equipment under test power cable into the receptacle on the panel of the meter.
3.) Connect the ECG cable to the scanner and the Patient leads to the analyzer.
4.) Select the Patient lead leakage function on the meter.

NOTE: Consult the manufacturer's user manual of the Safety Analyzer.

5.) Test opening and closing the ground with the scanner on and off as indicated in 9-11 or 9-12 as applicable.

NOTE: Consult the manufacturer's user manual of the Safety Analyzer that will be used to perform the tests.

Measurements should be made under the test conditions specified in:

- 9-11 on page 9-18, or
- 9-12 on page 9-18 as applicable.

9-8-7-2 Generic Procedure (cont'd)

For each combination, the operating controls, such as the lead switch, should be operated to find the worst case condition.

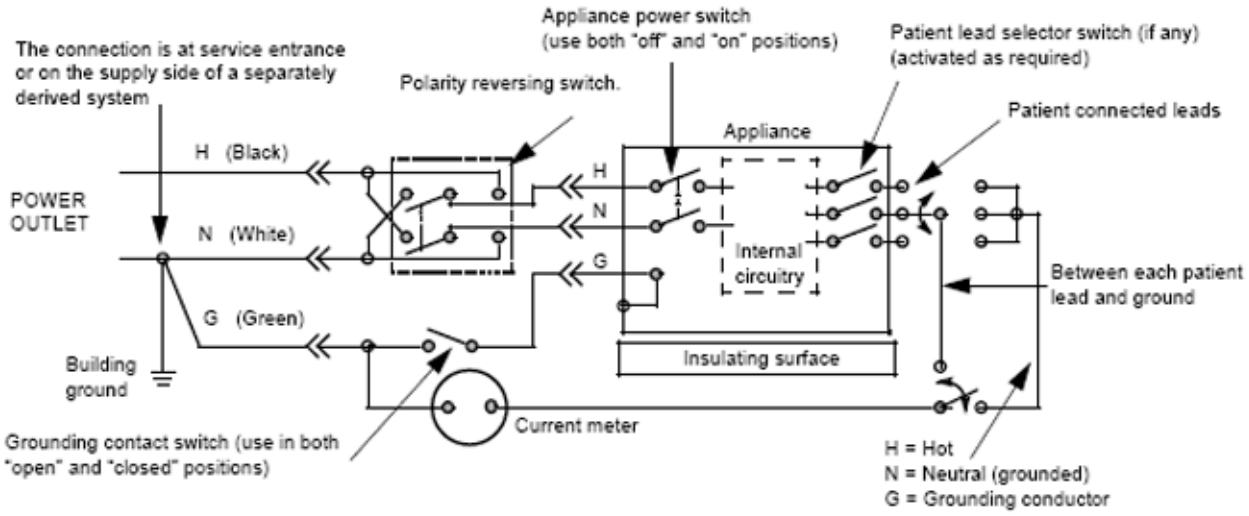


Figure 9-8 Test Circuit for Measuring Patient Lead Leakage

9-8-8 Isolated patient lead (source) leakage–lead to lead

Select and test each of the ECG lead positions (except ALL) on the LEAD selector, testing each to the power and ground condition combinations found in:

- 9-11 on page 9-18, or
- 9-12 on page 9-18 as applicable.

Record the highest leakage current measured.

9-8-8-1 Lead to lead leakage test record

Table 9-17 below shows a typical format for recording the patient lead to lead leakage current.

- 9-11 on page 9-18, or
- 9-12 on page 9-18 as applicable.

Measurements should be recorded from each lead combination under each set of test conditions specified in:

Record all data on the EQC inspection certificate. Also known as Patient Auxiliary Current

1.) Connect Safety analyzer to wall AC power outlet
2.) Plug the equipment under test (Scanner) power cable into the receptacle on the panel of the meter.
3.) Connect the ECG cable to the scanner and the Patient leads to the analyzer
4.) Select the Lead to lead or Patient Auxiliary leakage function on the meter

NOTE: Consult the manufacturer's user manual of the Safety Analyzer.

Table 9-16 Typical data format for recording the patient lead to lead leakage current

Unit under test_____ Date of test:_____				
Test Conditions		**Patient Lead or Combination Measured**		
System Power	**Grounding/PE**	**RA-LA**	**LA-LL**	**LL-RA**
Mains On	Open			
RF On	Open			

NOTE: Values in italics font are given as examples only.

9-8-9 Isolated patient lead (sink) leakage-isolation test

CAUTION **Line voltage is applied to the ECG leads during this test. To avoid possible electric shock hazard, the Ultrasound system being tested must not be touched by patients, users or anyone while the ISO TEST switch is depressed. When the meter's ground switch is OPEN, don't touch the Ultrasound system!**

9-8-9-1 Isolated lead (sink) leakage test record

Table 9-17 below shows a typical format for recording the isolated patient lead sink leakage current.

Measurements should be recorded for the full lead combination under each set of test conditions specified in:

- 9-11 on page 9-18, or
- 9-12 on page 9-18 as applicable.

Record all data on the Inspection Certificate.

Table 9-17 Typical data format for recording isolated lead (sink) leakage

Unit under test_____ Date of test:_____		
Test Conditions	**Patient Lead**	
System Power	**Grounding/PE**	**RA+LA+LL**
On	Closed	
Off	Closed	

NOTE: Values in italics font are given as examples only.

1.) Connect Safety analyzer to wall AC power outlet
2.) Plug the equipment under test power cable into the receptacle on the panel of the meter.
3.) Connect the ECG cable to the scanner and the Patient leads to the analyzer
4.) Select the Lead isolation or main applied function on the meter

NOTE: Consult the manufacturer's user manual of the Safety Analyzer

- Test opening and closing the ground with the scanner on and off as indicated in 9-11 or 9-12 as applicable.

9-8-10 Probe leakage current test

DANGER **DO NOT USE THE PROBE IF THE INSULATING MATERIAL HAS BEEN PUNCTURED OR OTHERWISE COMPROMISED. INTEGRITY OF THE INSULATION MATERIAL AND PATIENT SAFETY CAN BE VERIFIED BY SAFETY TESTING ACCORDING TO IEC60601-1.**

This test measures the current that would flow to ground from any of the probes through a patient who is being scanned and becomes grounded by touching some other grounded surface.

NOTE: Some leakage current is expected on each probe, depending on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement. It is abnormal if no leakage current is measured. If no leakage current is detected, check the configuration of the test equipment.

9-8-10-1 Generic Procedure on Probe Leakage Current

The most common method of measuring probe leakage is to partly immerse the probe into a saline bath while the probe is connected to the Ultrasound system and active. This method measures the actual leakage current resulting from the transducer RF drive.

Measurements should be made under the test conditions specified in:

- 9-11 on page 9-18, or
- 9-12 on page 9-18 as applicable.

For each combination, the probe must be active to find the worst case condition.

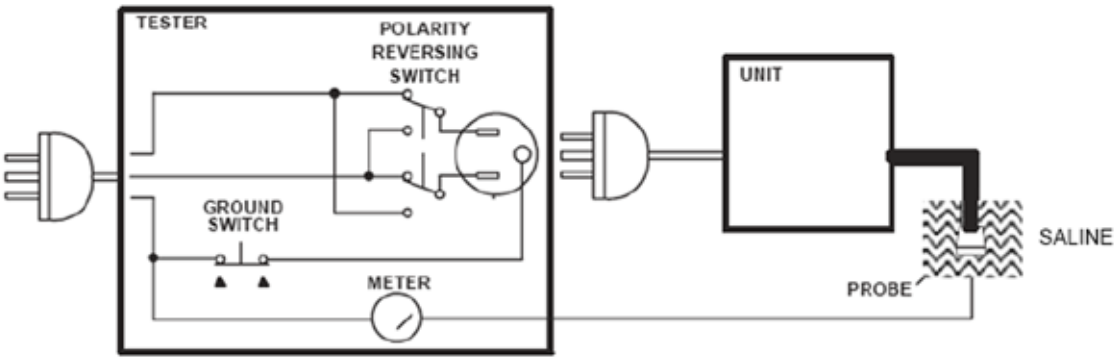


Figure 9-9 Set Up for Probe Leakage Current

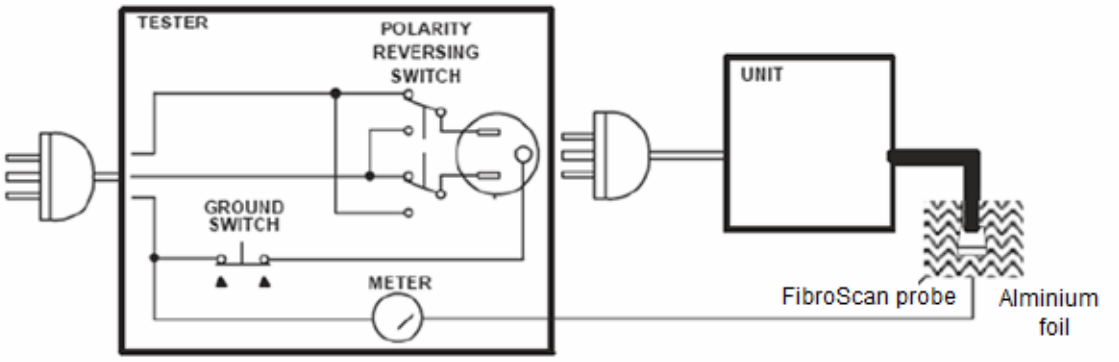


Figure 9-10 Set Up for FibroScan Probe Leakage Current

9-8-10-1 Generic Procedure on Probe Leakage Current (cont'd)

Figure 9-11 Test set with meter

NOTE: Each probe will have some amount of leakage current, dependent on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement.

The ultrasound probe's imaging area is immersed in the Saline solution along with a grounding probe from the test meter to complete the current path.

NOTE: The Saline solution is a mixture of water and salt. The salt adds free ions to the water, making it conductive. Normal saline solution is 0.9% salt and 99.1% water. If ready-mixed saline solution is not available, a mixture of 1 quart or 1 liter water with 9 or more grams of table salt, mixed thoroughly, will substitute..

CAUTION To avoid probe damage and possible electric shock, do not immerse probes into any liquid beyond the level indicated in the probe users manual. Do not touch the probe, conductive liquid or any part of the unit under test while doing the test.

CAUTION FibroScan probe does not have resistance to water. DO NOT immerse FibroScan probe into any liquid, and use Aluminium foil instead of saline as below.

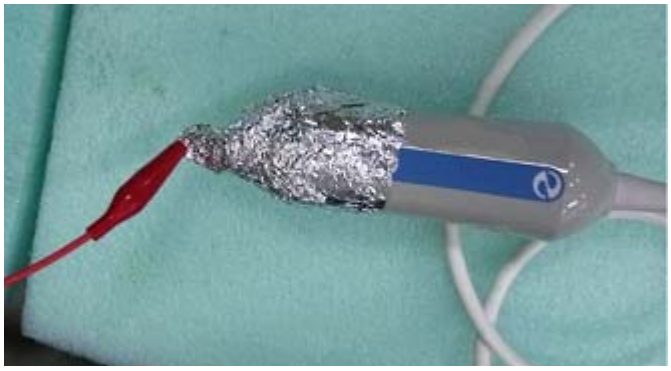


Figure 9-12 FibroScan probe with Aluminium foil

9-8-10-1 Generic Procedure on Probe Leakage Current (cont'd)

Follow the test conditions and test limits described in:

- 9-11 on page 9-18, or
- 9-12 on page 9-18 as applicable for every probe.

Keep a record of the results with other hard copies of maintenance data using Table 9-18 below.

CAUTION **Equipment damage possibility. Never switch the Polarity or the status of the Neutral when the Ultrasound system is powered on. Power off the Ultrasound system, allow the stored energy to bleed down, and turn the circuit breaker off BEFORE switching the POLARITY switch and/or the NEUTRAL switch on the leakage meter to avoid possible power supply damage**

Table 9-18 below shows a typical format for recording ultrasound probe source leakage current.

- 9-11 on page 9-18, or
- 9-12 on page 9-18 as applicable.

NOTE: Values in italics font are given as examples only.

Table 9-18 Typical data format for recording probe (source) leakage

Unit under test_____ Date of test:_____					
Test Conditions		**Probe as measured in saline bath**			
System Power	**Grounding/PE**	**C2-9-D**	**9L-D**	**S4-10-D**	**IC5-9-D**
Off	Closed				
Off	Open				
On	Closed				
On	Open				

9-8-11 Mains on applied part

NOTE: Mains Applied refers to the sink leakage test where mains (supply) voltage is applied to the part to determine the amount of current that will pass (or sink) to ground if a patient contacted mains voltage.

Mains on applied part is one of the described leakage current tests applicable for probes (Ref: IEC60601-1). This is to be performed with the probe disconnected from the Ultrasound system. Apply mains voltage over the insulation barrier. (Between protective earth on the probe connector, and an electrical anode in saline solution. The patient applied part of the probe is immersed into the saline solution.) Measure current flowing in the circuit. = leakage current.

As a minimum, tests according to IEC60601-1 must be performed once a year. The requirements for Body Floating (BF) have to be applied for TEE and Trans thorax probes bearing the symbol for safety class BF.

The symbol for BF is indicated on the probe connector label below:

Figure 9-13 GE Probe Connector Label example

NOTE: This test is not needed for Type B applied part (example, FibroScan probe).

9-8-11 Mains on applied part (cont'd)

Where applicable, a typical test setup of non-TEE Probes can be as illustrated in 9-8-10 "Probe leakage current test" on page 9-28.

A typical test setup for TEE probes could be as indicated below:

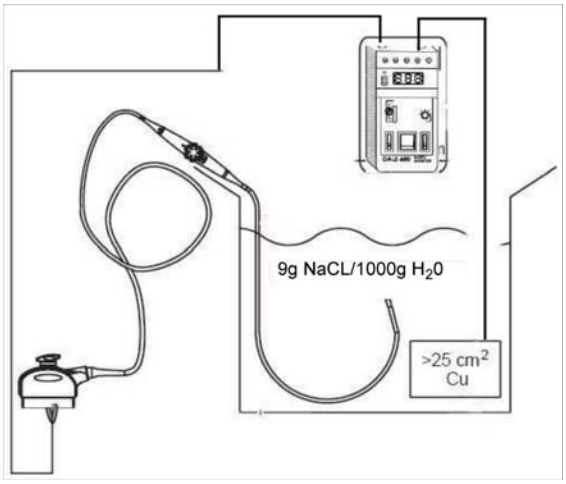


Figure 9-14 TEE Probe Leakage Isolation (Sink) Current Test

WARNING ***The handle of the TEE probes must not be immersed***

The test passes when the reading measure less than the values in: 9-13 on page 9-19.

9-8-12 e-TRAX (source) Leakage Current Test

9-8-12-1 Definition

CAUTION **Equipment damage possibility. Never switch the Polarity and the status of Neutral when the unit is powered ON. Be sure to turn the unit power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the unit may be damaged.**

This test measures the current that would flow to ground from e-TRAX Needle sensor (if installed) through a patient who is being scanned and becomes grounded by touching some other grounded surface.

9-8-12-2 Generic Procedure on Leakage Current

Refer to section 9-8-10-1, Generic Procedure on Probe Leakage Current for detail. Put the e-TRAX Needle sensor into Saline water instead of Probes.

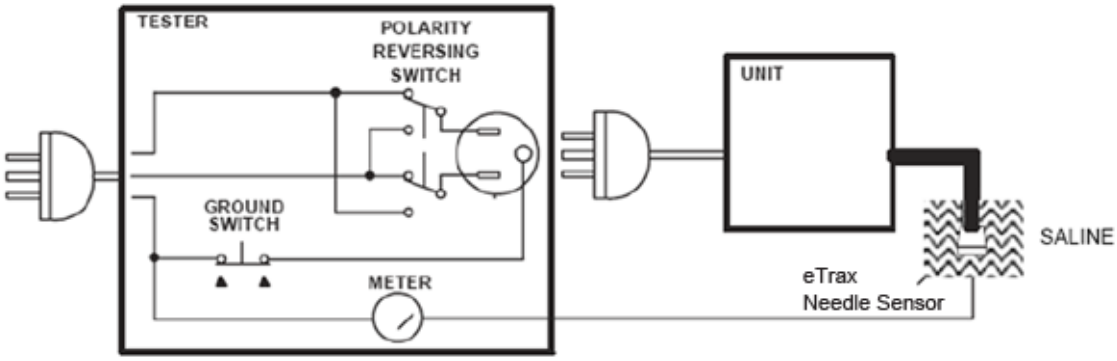


Figure 9-15 Set Up for e-TRAX Leakage Current

9-8-13 e-TRAX Leakage current - Mains to CF Applied part

DANGER **Electric Shock Hazard.**

Line voltage is applied to e-TRAX during this test. To avoid possible electric shock hazard, the system being tested must not be touched by patients, users or anyone during testing.

CAUTION **Equipment damage possibility. Never switch the Polarity and the status of Neutral when the unit is powered ON. Be sure to turn the unit power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the unit may be damaged.**

Reference the procedure in the IEC 60601-1. Measure leakage current flow from mains to CF Applied part.

9-8-13-1 e-TRAX (sink) Leakage Test Record

Table 9-19 below shows a typical format for recording e-TRAX sink leakage current.

Measurements should be recorded for the full lead combination under each set of test conditions specified in:

- 9-11 on page 9-18, or
- 9-12 on page 9-18 as applicable.

Record all data on the inspection certificate.

Table 9-19 Typical data format for recording e-TRAX (Sink) leakage

Unit under test_____ Date of test:_____		
Test Conditions		e-TRAX Needle Sensor
System Power	Grounding/PE	
On	Closed	
Off	Closed	

Section 9-9
When There's Too Much Leakage Current...

9-9-1 Chassis Fails

Check the ground on the power cord and plug for continuity. Ensure the ground is not broken, frayed, or intermittent. Replace any defective part.

Where applicable, tighten all grounds. Ensure star washers are under all ground studs.

Inspect wiring for bad crimps, poor connections, or damage.

Test the wall outlet; verify it is grounded and is free of other wiring abnormalities. Notify the user or owner to correct any deviations. As a work around, check the other outlets to see if they could be used instead.

NOTE: No outlet tester can detect the condition where the white neutral wire and the green grounding wire are reversed. If later tests indicate high leakage currents, this should be suspected as a possible cause and the outlet wiring should be visually inspected.

9-9-2 Probe Fails

Test another probe to isolate if the fault lies with the probe or the scanner.

NOTE: Each probe will have some amount of leakage, dependent on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement. The maximum allowable leakage current for body surface contact probe differs from an inter-cavity probe. Be sure to enter the correct probe type in the appropriate space on the check list.

If excessive leakage current is slot dependent, inspect the Ultrasound system connector for bent pins, poor connections, and ground continuity.

If the problem remains with the probe, replace the probe.

9-9-3 Peripheral Fails

Tighten all grounds. Ensure star washers are under all ground studs.

Inspect wiring for bad crimps, poor connections, or damage.

9-9-4 Still Fails

If all else fails, begin isolation by removing the probes, external peripherals, then the on board ones, one at a time while monitoring the leakage current measurement.

Where applicable, in the case of using a UPS (uninterruptible power supply), perform the tests in the "Electrical Safety tests" section without using the UPS (i.e. directly connect the Ultrasound system to the AC wall outlet). If this leads to a pass result, the specific UPS must no longer be used.

9-9-4-1 New Unit

If the leakage current measurement tests fail on a new Ultrasound system and if situation can not be corrected, submit a Safety Failure Report to document the Ultrasound system problem. Remove Ultrasound system from operation

9-9-5 ECG Fails

Inspect cables for damage or poor connections.

9-9-6 Ultrasound Equipment Quality Check (EQC and IQC)

Download and use the latest version of these forms. They can be retrieved from MyWorkshop.

• EQC -- Refer to DOC0929340 in MyWorkshop

ULTRASOUND INSPECTION CERTIFICATE

Customer Name:		System ID:	Dispatch Number / Date Performed:	Warranty/Contract/HBS
System Type		Model Number:	Serial Number:	Manufacture Date:
Probe 1:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 2:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 3:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 4:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 5:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 6:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 7:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 8:	Frequency:	Scan Format*:	Model Number:	Serial Number:
Probe 9:	Frequency:	Scan Format*:	Model Number:	Serial Number:

* Scan Format: Phased Array, Linear Array, Curved Array, Mechanical Array or Other

FUNCTIONAL CHECKS PHYSICAL INSPECTION AND CLEANING

Functional Check (if applicable)	OK? or N/A		Physical Inspection and Cleaning (if applicable)	Inspect	Clean
B-Mode Function			Console		
M-Mode Function			Monitor		
Doppler Modes Functions					
Color Modes Functions			Air Filter		
3D/4D-Mode Function			Probe Holders		
Applicable Software Options			External I/O		
Applicable Hardware Options			Wheels, Brakes & Swivel Locks		
Control Panel			Cables and Connectors		
Monitor			Approved Peripherals (DVR, DVD Drive, Printers, etc.)		
Measurement Accuracy					

COMMENTS:

ELECTRICAL SAFETY

Electrical Test Performed	Max Value Allowed	Value Measured	OK?	Comments
Outlet (correct ground &wiring config.)				
System Ground Continuity				
Chassis Source Leakage Current - Probe				
Chassis Source Leakage Current - Wheel				
Chassis Source Leakage Current - CRT				
Patient Lead Source Leakage (Lead to Ground)				
Patient Lead Source Leakage (Lead to Lead)				
Patient Lead Source Leakage (Isolation)				
Peripheral 1 Leakage Current				
Peripheral 1Ground Continuity				
Peripheral 2 Leakage Current				
Peripheral 2Ground Continuity				
Peripheral 3 Leakage Current				
Peripheral 3Ground Continuity				
PROBES				
Probe Number (from previous page)	**Max Value Allowed**	**Max Value Measured**	**OK?**	**Comments**
Probe 1:				
Probe 2:				
Probe 3:				
Probe 4:				
Probe 5:				
Probe 6:				
Probe 7:				
Probe 8:				
Probe 9:				

Final Check. All system covers are in place. System scans with all probes as expected.

Accepted by: _____

INDEX

GE Medical Systems, a General Electric Company,
going to market as GE Healthcare.

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