

GE

LOGIQ F Series

Basic Service Manual



Part Number: 5446617-100
Revision: 5

Important Precautions

WARNING
(EN)

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.
- 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.
- 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.

AVERTISSEMENT
(FR)

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.
- 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.

WARNUNG
(DE)

ESTE MANUAL DE SERVICIO SÓ LO EXISTE EN INGLÉS.

AVISO
(ES)

- 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.

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

ATENÇÃO
(PT-Br)

- 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 TENHA TENTE REPARAR O EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO ESTE MANUAL DE ASSISTÊNCIA TÉCNICA.
- O NÃO CUMPRIMENTO DESTA AVISO PODE POR EM PERIGO A SEGURANÇA DO TÉCNICO, OPERADOR OU PACIENTE DEVIDO A CHOQUES ELÉTRICOS, MECÂNICOS OU OUTROS.

ESTE MANUAL DE ASSISTÊNCIA ESTÁ DISPONÍVEL APENAS EM INGLÊS.

AVISO
(PT-pt)

- 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 TENHA EFECTUAR REPARAÇÕES NO EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO PREVIAMENTE ESTE MANUAL.
- A INOBSERVÂNCIA DESTA 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.

IL PRESENTE MANUALE DI MANUTENZIONE è DISPONIBILE SOLTANTO IN INGLESE.

AVVERTENZA
(IT)

- 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 TÖLKEEENUSE 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 TAGAJARJEL.**

**VAROITUS
(FI)**

TÄMÄ HUOLTO-OHJE ON SAATAVILLA VAIN ENGLANNIKSI.

- **JOS ASIAKKAAN PALVELUNTARJOAJA VAATII MUUTA KUIN ENGLANNINKIELISTÄ MATERIAALIA, TARVITAVAN 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 ÉRHEŐ 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 ÁRAMÚTÉS, MECHANIKAI VAGY EGYÉB VESZÉLYHELYZET MIATTI SÉRÜLÉSÉT EREDMÉNYEZHETI.**

**VIÐVÖRUN
(IS)**

ÞESSI ÞJÓNUSTUHANDBÓK ER EINGÖNGU FÁANLEG Á ENSKU.

- **EF ÞJÓNUSTUADILI 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 PŘ ÍPADĚ, 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 TĚTO VÝSTRAHY MŮŽE DOJÍT ÚRAZU ELEKTRICKÁM PROUDEM PRACOVNÍKA POSKYTOVATELE SLUŽEB, OBSLUŽNÉHO PERSONÁLU NEBO PACIENTŮ VLIVEM ELEKTRICKÉHO 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 ANGLŪ VALODĀ.

- JA KLIENTA APKALPES SNIEDZĒJAM NEPIECIEŠAMA INFORMĀCIJA CITĀ VALODĀ, NEVIS ANGLŪ, 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 ANGLŪ KALBA.

- JEI KLIENTO PASLAUGŲ TEIKĖJUI REIKIA VADOVO KITA KALBA – NE ANGLŪ, VERTIMU PASIRŪPINTI TURI KLIENTAS.
- NEMĖGINKITE ATLIKTI ĮRANGOS TECHININĖS 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 JEDYNIEM W JĘZYKU ANGIELSKIM.

- JEŚ LI FIRMA Ś WIADCZYŁA KLIENTOWI USŁUGI SERWISOWE WYMAGA UDOSTĘPNIENIA PODRĘCZNIKA W JĘZYKU INNYM NIŻ ANGIELSKI, OBOWIĄZEK ZAPEWNIENIA STOSOWNEGO TŁUMACZENIA SPOCZYWA NA KLIENCIE.
- NIE PRÓBUJĄC 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 ZAGROŻEŃ.

ACEST MANUAL DE SERVICE ESTE DISPONIBIL NUMAI ÎN LIMBA ENGLEZĂ.

- **DACĂ UN FURNIZOR DE SERVICII PENTRU CLIEŢI NECESITĂ O ALTĂ LIMBĂ DECÂT CEA ENGLEZĂ, ESTE DE DATORIA CLIENTULUI SĂ FURNIZEZE O TRADUCERE.**
- **NU ÎNCERCAŢI SĂ REPARAŢI ECHIPAMENTUL DECÂT ULTERIOR CONSULTĂRII ŞI ÎNŢELEGERII 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.**

**ATENŢIE
(RO)**

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 ЭЛЕКТРИЧЕСКИМ ТОКОМ, МЕХАНИЧЕСКУЮ ТРАВМУ ИЛИ ДРУГОЕ ПОВРЕЖДЕНИЕ.**

**ОСТОРОЖНО!
(RU)**

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.**

**ПРЕДУПРЕЖДЕНИЕ
(BG)**

OVAJ PRIRUČNIK ZA SERVISIRANJE DOSTUPAN JE SAMO NA ENGLJESKOM JEZIKU.

- **АКО КЛИЈЕНТОВ СЕРВИСЕР ЗАХТЕВА ЈЕЗИК КОЈИ НИЈЕ ЕНГЛЕСКИ, ОДГОВОРНОСТ ЈЕ НА КЛИЈЕНТУ ДА ПРУЖИ УСЛУГЕ ПРЕВОЂЕНЈА.**
- **НЕМОЈТЕ ПОКУШАВАТИ ДА СЕРВИСИРАТЕ ОПРЕМУ АКО НИСТЕ ПРОЉИТАЛИ И РАЗУМЕЛИ ПРИРУЉНИК ЗА СЕРВИСИРАЊЕ.**
- **АКО НЕ ПОШТУЈЕТЕ ОВО УПОЗОРЕЊЕ, МОЖЕ ДОЉИ ДО ПОВРЕЂИВАЊА СЕРВИСЕРА, ОПЕРАТЕРА ИЛИ ПАЦИЈЕНТА УЗРОКОВАНОГ ЕЛЕКТРИЉНИМ УДАРОМ, МЕХАНИЉКИМ И ДРУГИМ ОПАСНОСТИМА.**

**UPOZORENJE
(SR)**

TA SERVISNI PRIROČNIK JE NA VOLJO SAMO V ANGLEŠČINI.

**OPOZORILO
(SL)**

- 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.

OVAJ SERVISNI PRIRUČNIK DOSTUPAN JE SAMO NA ENGLESKOM JEZIKU.

**UPOZORENJE
(HR)**

- 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.

TÁTO SERVISNÁ PRÍRUČKA JE K DISPOZÍCII LEN V ANGLIČTINE.

**UPOZORNENIE
(SK)**

- 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.

DEN HÄR SERVICEHANDBOKEN FINNS BARA TILLGÄNGLIG PÅ ENGELSKA.

**VARNING
(SV)**

- 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.

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 TÜRDE KAZALAR SONUCUNDA TEKNİSYENİN, OPERATÖRÜN YA DA HASTANIN YARALANMASINA YOL AÇABİLİR.

DİKKAT
(TR)

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(JA)

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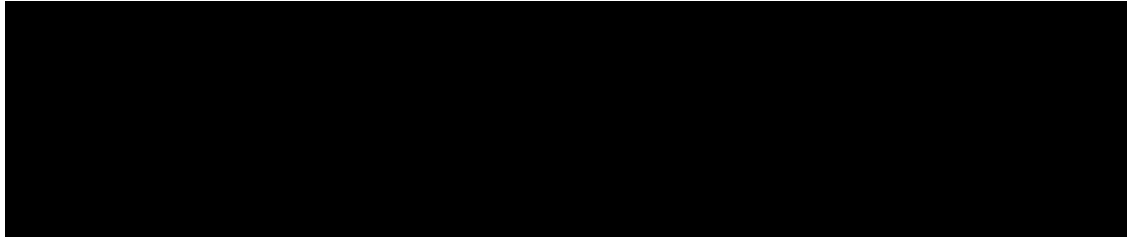
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(繁體中文)
Traditional
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경고
(KO)



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GE Medical Systems (China) Co., Ltd.
No.19 Changjiang Road
WuXi National Hi-Tech Development Zone
Jiangsu, P.R China 214028
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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.

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Revision History

Revision	Date	Reason for change
1	2013/01/10	Initial Release.
2	2013/06/15	Update for CRU part list update.
3	2013/10/09	Update for CRU part list update.
4	2014/05/20	Update for AC power cord update.
5	2014/10/29	Update for printer list update

List of Effected Pages(LOEP)

Pages	Revision	Pages	Revision
Title Page	N/A	Chapter 5 - Theory pages 5-1 to 5-4	5
Important Precautions i to ix	5	Chapter 6 - Service Adjustments pages 6-1 to 6-2	5
Table of Contents pages i to xii	5	Chapter 7 - Diagnostics/Troubleshooting pages 7-1 to 7-10	5
Chapter 1 - Introduction pages 1-1 to 1-14	5	Chapter 8 - Replacement Procedures pages 8-1 to 8-8	5
Chapter 2 - Pre-Installation pages 2-1 to 2-10	5	Chapter 9 - Replacement Parts pages 9-1 to 9-6	5
Chapter 3 - Installation pages 3-1 to 3-24	5	Chapter 10 - Periodic Maintenance pages 10-1 to 10-18	5
Chapter 4 - Functional Checks pages 4-1 to 4-33	5	Index pages I to II	5

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Chapter 1

Introduction

Section 1-1 Overview

1-1-1 Purpose of Chapter 1

This chapter describes important issues related to safely servicing the LOGIQ F Series. The service provider must read and understand all the information presented in this manual before installing or servicing a unit.

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1-1-2 Purpose of Service Manual

This Service Manual provides installation and service information for the LOGIQ F Series and contains the following chapters:

- 1.) **Chapter 1 - Introduction:** Contains a content summary and warnings.
- 2.) **Chapter 2 - Site Preparations:** Contains pre-installation requirements for the LOGIQ F Series.
- 3.) **Chapter 3 - System Setup:** Contains installation procedures.
- 4.) **Chapter 4 - Functional Checks:** Contains functional checks that are recommended as part of the installation, or as required during servicing and periodic maintenance.
- 5.) **Chapter 5 - Components and Functions (Theory):** Contains block diagrams and functional explanations of the electronics.
- 6.) **Chapter 6 - Service Adjustments:** Contains instructions on how to make available adjustments to the LOGIQ F Series.
- 7.) **Chapter 7 - Diagnostics/Troubleshooting:** Provides procedures for running diagnostic or related routines for the LOGIQ F Series.
- 8.) **Chapter 8 - Replacement Procedures:** Provides disassembly procedures and reassembly procedures for all changeable Field Replaceable Units (FRU).
- 9.) **Chapter 9 - Renewal Parts:** Contains a complete list of field replaceable parts for the LOGIQ F Series.
- 10.) **Chapter 10 - Care & Maintenance:** Provides periodic maintenance procedures for the LOGIQ F Series.

1-1-3 Typical Users of the Basic Service Manual

- Service Personnel (installation, maintenance, etc.).
- Hospital's Service Personnel
- Contractors (Some parts of Chapter 2 - Site Preparation)

1-1-4 Purpose of Operator Manual(s)

The Operator Manual(s) should be fully read and understood before operating the LOGIQ F Series and also kept near the unit for quick reference.

NOTE: Probe information displayed on screen does not necessarily reflect the probes available on your ultrasound system. Please refer to the probe list for available probes and features.

1-1-5 LOGIQ F Series Models Covered by this Manual

Table 1-2 LOGIQ F3 Model Designations

Part Number	Description
5478043	LOGIQ F3 Console for China
5478051	LOGIQ F3 Console (except China)

Table 1-3 LOGIQ F5 Model Designations

Part Number	Description
5478049	LOGIQ F5 Console for China (3 Probe Ports)
5478050	LOGIQ F5 Console for China (4 Probe Ports)

Table 1-4 LOGIQ F6 Model Designations

Part Number	Description
5478040	LOGIQ F6 Console for Europe and EAGM
5478041	LOGIQ F6 Console for APAC
5478042	LOGIQ F6 Console for India
5478044	LOGIQ F6 Console for Latin America
5478045	LOGIQ F6 Console for China (3 Probe Ports)
5478046	LOGIQ F6 Console for China (4 Probe Ports)
5478047	LOGIQ F6 Console for global (3 Probe Ports)
5478048	LOGIQ F6 Console for global (19" LCD)

Table 1-5 LOGIQ F8 Model Designations

Part Number	Description
5478035	LOGIQ F8 Console for China
5478037	LOGIQ F8 Console for Europe and EAGM
5478038	LOGIQ F8 Console for India
5478039	LOGIQ F8 Console for Latin America and APAC

1-1-6 Peripheral List

Table 1-6 LOGIQ F Series Peripheral List

Item	Part Name	Part Number	Qty	FRU
Printers				
8000	Sony UP-D897 Chinese kit	5151262	1	Y
8000A	Sony UP-D897 USA kit	5151259	1	Y
8000B	Sony UP-D897 European kit	5151261	1	Y
8000C	Sony UP-D897 Japanese kit	5151263	1	Y
8000D	Sony UP-D897 Brazil kit	5495509	1	Y
8001	Sony UP-D25MD USA kit	5398062	1	Y
8001A	Sony UP-D25MD European kit	5398063	1	Y
8001B	Sony UP-D25MD Japanese kit	5398064	1	Y
8001C	Sony UP-D25MD Chinese kit	5398061	1	Y
8002	Sony UP-D711MD	5449734	1	Y
8003	HP Officejet 100 Chinese kit	5426594	1	Y
8003A	HP Officejet 100 European kit	5426595	1	Y
8003B	HP Officejet 100 Japanese kit	5426596	1	Y
8003C	HP Officejet 100 USA kit	5426597	1	Y
8004	Sony UP-D898MD Chinese kit	5151262-2	1	Y
8004A	Sony UP-D898MD USA kit	5151259-2	1	Y
8004B	Sony UP-D898MD European kit	5151261-2	1	Y
8004C	Sony UP-D898MD Japanese kit	5151263-2	1	Y
8004D	Sony UP-D898MD Brazil kit	5495509-2	1	Y
8005	HP Officejet Pro 8100	NA	1	Y
DVD-RW				
8006	LITEON eUAU108	5454614-2	1	Y
Footswitch				
8007	MKF 2-MED GP26 (IPx8)	5151236	1	Y
8008	FSU-1000 (IPx8)	5338419	1	Y
USB Stick				
8009	SanDisk CRUZER 4G	5395754	1	Y
8010	1TB mobile USB HDD	5434317-3	1	Y
ECG Module				
8011	USB ECG Module (AHA)	5173122	1	Y
8012	USB ECG Module (IEC)	5173040	1	Y
Biopsy Kit				

Table 1-6 LOGIQ F Series Peripheral List

Item	Part Name	Part Number	Qty	FRU
8013	E8C-RS biopsy kit	2398164	1	Y
8014	E8C-RS biopsy kit	E8385MJ	1	Y
8015	E8C-RS reusable biopsy kit	2398164	1	Y
8016	L6-12-RS reusable biopsy kit	5176499	1	Y
8017	3Sc-RS reusable biopsy kit	5329137	1	Y
8018	RAB2-6-RS reusable biopsy kit	KTD106236	1	Y

1-1-6 Peripheral List (cont'd)

Item	Part Name	Part Number	Qty	FRU
8019	LOGIQ F Series R1.0.0 System and Application Software USB	5485882-S	1	Y
8019A	LOGIQ F Series R1.0.1 System and Application Software USB	5485882-2S	1	Y
8019B	LOGIQ F Series R1.0.2 System and Application Software USB	5485882-3S	1	Y
8017C	LOGIQ F Series R1.0.3 System and Application Software USB	5485882-4S	1	Y
8019D	LOGIQ F Series R1.0.3 System and Application Software USB	5495846-4S	1	Y
8019E	LOGIQ F Series R1.0.4 System and Application Software USB	5495846-5S	1	Y
8019F	LOGIQ F Series R1.0.5 System and Application Software USB	5495846-6S	1	Y
8019G	LOGIQ F Series R1.0.6 System and Application Software USB	5495846-7S	1	Y
8019H	LOGIQ F Series R1.0.7 System and Application Software USB	5495846-8S	1	Y

Section 1-2 Important Conventions

1-2-1 Conventions Used in Book

Icons

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

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 are labeled in one of following 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.**



NOTICE **Equipment Damage Possible**

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







Example: Disk drive will crash.

NOTE: *Notes provide important information about an item or a procedure. Information contained in a NOTE can often save you time or effort.*

1-2-2 Standard Hazard Icons




Important information will always be preceded by the exclamation point contained within a triangle, 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.

Table 1-7 Standard Hazard Icons

ELECTRICAL	MECHANICAL	RADIATION
		
LASER	HEAT	PINCH
		

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

Table 1-8 Standard Icons Indicating a Special Procedure Be Used

AVOID STATIC ELECTRICITY	TAG AND LOCK OUT	WEAR EYE PROTECTION
		

1-2-3 Product Icons

Please refer to User Manual (Basic User Manual or User Guide) for the detail Product Icons information.

Section 1-3 Safety Considerations

1-3-1 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.

1-3-2 Human Safety


Servicing should be performed by authorized personnel only.
Only personnel who have participated in a LOGIQ F Series Training are authorized to service the equipment.

1-3-3 Mechanical Safety

 **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.*

 **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.*

 **CAUTION** The LOGIQ F Series weighs 65 kg 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:

Be sure the pathway is clear.

Use slow, careful motions.

Use two people when moving on inclines or lifting more than 65 kg (144 lbs).

 **WARNING** *AFTER UNPLUG POWER CORD, WAIT FOR AT LEAST 20 SECONDS FOR CAPACITORS TO DISCHARGE AS THERE ARE NO TEST POINTS TO VERIFY ISOLATION.*

1-3-3 Mechanical Safety (cont'd)

NOTE: Special care should be taken when transporting the unit in a vehicle:

- Secure the unit in an upright position.
- Lock the wheels (brake)

1-3-4 Electrical Safety

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. 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 *DO NOT SERVICE OR DISASSEMBLE PARTS UNDER FRU UNIT LEVEL AT ANY CIRCUMSTANCES.*

1-3-5 Label Locations

Refer to LOGIQ F Series User Guide Section Warning Label Location in Safety Chapter.

1-3-6 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** **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** **SHUT DOWN FORCEDLY OR PLUG IN/OUT ACDC INVALID MAY CAUSE THE DAMAGE OF SYSTEM FILES.**
-  **WARNING** **AFTER UNPLUG POWER CORD, WAIT FOR AT LEAST 20 SECONDS FOR CAPACITORS TO DISCHARGE AS THERE ARE NO TEST POINTS TO VERIFY ISOLATION.**

1-3-7 Returning/Shipping Probes and Repair Parts

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

GEMS policy states that body fluids must be properly removed from any part or equipment prior to shipment. GEMS 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 an 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 USER/SERVICE staff should dispose all the waste properly as per federal, state, and local waste disposal regulation.*

Section 1-4 EMC, EMI, and ESD

1-4-1 Electromagnetic Compatibility (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 to 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 or 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.

1-4-2 CE Compliance

The LOGIQ F Series unit 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.

For applicable standards refer to the Safety Chapter in the Basic User Manual.

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.*

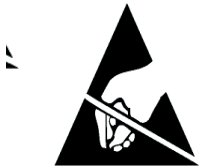
1-4-3 Electrostatic Discharge (ESD) Prevention



WARNING

DO NOT TOUCH ANY BOARDS WITH INTEGRATED CIRCUITS PRIOR TO TAKING THE NECESSARY ESD PRECAUTIONS:

1.FOLLOW GENERAL GUIDELINES FOR HANDLING OF ELECTROSTATIC SENSITIVE EQUIPMENT.




Section 1-5 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.) Remove battery.
 - 6.) Control all stored and residual energy.
 - 7.) Verify isolation.
- All potentially hazardous stored or residual energy is relieved.



NOTICE Energy Control and Power Lockout for LOGIQ F Series

WHEN SERVICING PARTS OF THE SYSTEM WHERE THERE IS EXPOSURE TO VOLTAGE GREATER THAN 30 VOLTS:

1. TURN OFF THE SCANNER.
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 AMBER LIGHT ON THE OP PANEL ON/OFF BUTTON WILL TURN OFF.
5. REMOVE THE SYSTEM BATTERY.



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

GE Healthcare policy states that body fluids must be properly removed from any part or equipment prior to shipment. GE Healthcare 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 an 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 that 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 purposes and must be transported as a hazardous material.*

NOTE: *The USER/SERVICE staff should dispose all the waste properly as per federal, state, and local waste disposal regulation.*

Section 1-6 Customer Assistance

1-6-1 Contact Information

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

Prepare the following information before you call:

- System ID serial number.
- Software version.

Table 1-9 Phone Numbers for Customer Assistance

Location	Phone Number	
USA GE Vingmed Ultrasound Ultrasound Service Engineering 9900 Innovation Drive Wauwatosa, WI 53226	Service: On-site	1-800-437-1171
	Service Parts	1-800-558-2040
	Application Support	1-800-682-5327 or 1-262-524-5698
Canada		1-800-668-0732
Latin America	Service	1-800-321-7937
	Application Support	1-262-524-5698
Europe (OLC- EMEA) GE Ultraschall Deutschland GmbH Beethovenstraße 239 Postfach 11 05 60, D-42655 Solingen Germany	OLC - EMEA Phone: +49 (0)212 2802 - 652 +33 1 3083 1300 Fax: +49 (0) 212 2802 - 431	
Online Services Ultrasound Asia Australia China India Japan Korea Singapore	Phone: +(61) 1-800-647-855 +(86) 800-810-8188 +(91) 1-800-11-4567 +(81) 42-648-2924 +(82) 2620 13585 +(95) 6277-3444	

1-6-2 System Manufacturer

Table 1-10 System Manufacturer

Manufacturer	FAX Number
GE Medical Systems (China) Co., Ltd. No.19, Changjiang Road, Wuxi National Hi-Tech Development Zone, Jiangsu, P.R. China 214028	TEL: +86 510-85225888 FAX: +86 510-85226688

1-6-3 Factory Site

Table 1-11 Factory Site

Factory Site	FAX Number
GE Medical Systems (China) Co., Ltd. No.19, Changjiang Road, Wuxi National Hi-Tech Development Zone, Jiangsu, P.R. China 214028	TEL: +86 510-85225888 FAX: +86 510-85226688

Chapter 2

Site Preparations

Section 2-1 Overview

2-1-1 Purpose of chapter 2

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

Table 2-1 Contents in Chapter 2

Section	Description	Page Number
2-1	Overview	2-1
2-2	General Console Requirements	2-2
2-3	Facility Needs	2-6

Section 2-2 General Console Requirements

2-2-1 Console Environmental Requirements

Table 2-2 Environmental Requirements for LOGIQ F Series

	Operational	Storage	Transport
Temperature	3 - 40°C 37 - 104 °F	-5 - 50 °C 23 - 122°F	-5 - 50 °C 23 - 122°F
Humidity	30 - 80% non-condensing	10 - 90% non-condensing	10 - 90% non-condensing
Pressure	700 - 1060hPa	700 - 1060hPa	700 - 1060hPa

*NOTE: Temperature in degrees C. Conversion to Degrees F = (Degrees C * 9/5) + 32.*

2-2-1-1 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 interface.

2-2-2 Electrical Requirements

NOTE: GE Healthcare requires a dedicated power and ground for the proper operation of its Ultrasound equipment. 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 unit is only a conduit.

2-2-2 Electrical Requirements (cont'd)

2-2-2-1 LOGIQ F Series Power Requirements

The following power line parameters should be monitored for one week before installation. We recommend that you use an analyzer Dranetz Model 606-3 or Dranetz Model 626:

Table 2-3 Electrical Specifications for LOGIQ F Series

PARAMETER	AREA	LIMITS
Voltage Range	100-240V~	400VA
Power	All applications	MAX. 400 VA
Line Frequency	All applications	50/60Hz
Power Transients	All applications	Less than 25% of nominal peak voltage for less than 1 millisecond for any type of transient, including line frequency, synchronous, asynchronous, or aperiodic transients.
Decaying Oscillation	All applications	Less than 15% of peak voltage for less than 1 millisecond.

2-2-2-2 Inrush Current

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

2-2-2-3 Site Circuit Breaker

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



CAUTION POWER OUTAGE MAY OCCURE.

The LOGIQ F Series 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.

2-2-2-4 Site Power Outlets

A dedicated AC power outlet must be within reach of the unit without extension cords. Other outlets adequate 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.

2-2-2-5 Unit Power Plug

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

2-2-2-6 Power Stability Requirements

Voltage drop-out

Max 10 ms.

Power Transients

(All applications)

Less than 25% of nominal peak voltage for less than 1 millisecond for any type of transient, including line frequency, synchronous, asynchronous, or aperiodic transients.

2-2-3 EMI Limitations

Ultrasound machines are susceptible to Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transient in the air wiring. They also generate EMI. The LOGIQ F Series complies with limits as stated on the EMC label. However there is no guarantee that interface 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 defect.

These sources include:

- medical lasers,
- scanners,
- cauterizing guns,
- computers,
- monitors,
- fans,
- gel warmers,
- microwave ovens,
- light dimmers,
- portable phones.

The presence of broadcast station or broadcast van may also cause interference. See for EMI Prevention tips.

See [Table 2-4](#) for EMI Prevention tips.

Table 2-4 EMI Prevention/abatement

EMI Rule	Details
Be aware of RF sources	Keep the unit at least 5 meters or 15 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 all screws, RF gaskets, covers, 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 interface with the ultrasound signals.
Replace broken RF gaskets	If more than 20% or a pair of fingers on the RF gaskets are broken, replace the gaskets. Do not turn on the unit until any loose metallic part is removed.
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. Or, if a label has been found in such a position, move the label.
Use GE specified harnesses and peripherals	The interconnect cables are grounded and require ferrite beads and other shielding. Also, cable length, material, and routing are all important; do not change from what is specified.
Take care with cellular phones	Cellular phones may transmit a 5 V/m signal; that could cause 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 Scan Probe Environmental Requirements

Operation: 3° to 40° C

Storage: -5° to 50° C

*NOTE: Temperature in degrees C. Conversion to Degrees F = (Degrees C * (9/5) + 32).*



NOTICE SYSTEMS AND ELECTRONIC PROBES ARE DESIGNED FOR STORAGE TEMPERATURES OF -10 TO + 60 degrees C. WHEN EXPOSED TO LARGE TEMPERATURE VARIATIONS, THE PRODUCT SHOULD BE KEPT IN ROOM TEMPERATURE FOR 10 HOURS BEFORE USE.

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. Use the Pre Installation checklist to verify that all needed steps have been taken, Purchaser reasonability includes:

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

NOTE: *All electrical installation 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, products involved (and the accompanying electrical installations) are highly sophisticated and special engineering competence is required. All electrical work on these product 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 (preferable prior to purchase).

The ultrasound suite must be clean proof 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.

2-3-2 Required Features

NOTE: *GE Medical Systems requires a dedicated power and ground for the proper operation of its Ultrasound equipment. 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.

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 unit is only a conduit.

- Dedicated single branch power outlet of adequate amperage meeting all local and national codes which is located less than 2.5 m (8 ft.) from the unit's proposed location
- Door opening is at least 76 cm (30 in) wide
- Proposed location for unit is at least 0.3 m (1 ft.) from the wall for 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.

2-3-3 Recommended and Alternate Ultrasound Room Layout

Recommended standard floor plan and a minimal floor plan for ultrasound equipment:

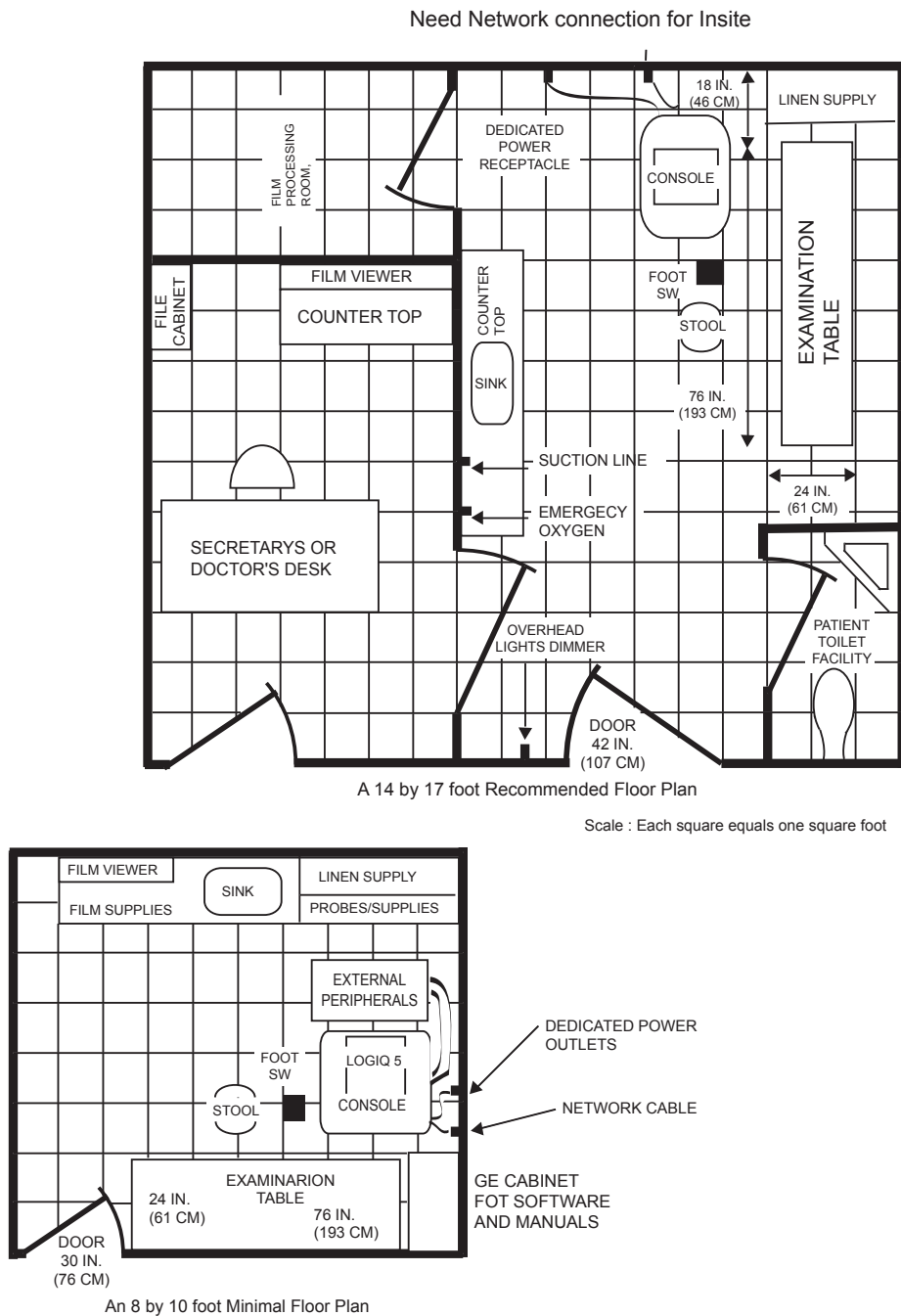


Figure 2-1 RECOMMENDED ULTRASOUND ROOM LAYOUT

2-3-4 Networking Pre-installation Requirements

2-3-4-1 Stand Alone Scanner (without Network Connection)

None.

2-3-4-2 Scanner Connected to Hospital's Network

Supported networks:

Wire LAN

2-3-4-3 Purpose of 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 monitor 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.

2-3-4-4 DICOM Option Pre-installation Requirements

To configure the LOGIQ F Series to work with other network connections, the site's network administrator must provide some necessary information.

Information must include:

- A host name, local port number, AE Title, IP address and Net Mask for the LOGIQ F Series.
- 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 F Series 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 solving errors.

2-3-4-4 DICOM Option Pre-installation Requirements (cont'd)

LOGIQ F
Host Name Local Port IP Address . . .

AE Title Net Mask . . .

ROUTING INFORMATION

	Destination IP Addresses				GATEWAY IP Addresses			
					Default			
ROUTER1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
ROUTER2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
ROUTER3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

DICOM APPLICATION INFORMATION

	NAME	MAKE/REVISION	AE TITLE	IP ADDRESSES	PORT
Store 1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	<input type="text"/>
Store 2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	<input type="text"/>
Store 3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	<input type="text"/>
Store 4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	<input type="text"/>
Store 5	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	<input type="text"/>
Store 6	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	<input type="text"/>
Worklist	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	<input type="text"/>
Storage Commit	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	<input type="text"/>
MPPS	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>	<input type="text"/>

Figure 2-2 Worksheet for DICOM Network Information

Chapter 3

System Setup

Section 3-1 Overview

3-1-1 Purpose of Chapter 3

This chapter contains information needed to install the unit. Included are references to 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 installation, and how to check and test the unit and external peripherals for electrical safety are included in this procedure. Also included LOGIQ F Series in this section are guidelines for transporting the unit to a new site.

Table 3-1 Contents in Chapter 3

Section	Description	Page Number
3-1	Overview	3-1
3-2	Setup Reminders	3-2
3-3	Receiving and Unpacking the Equipment	3-5
3-4	Preparing for Installation	3-7
3-5	Completing the Installation	3-5
3-6	System Configuration	3-6
3-7	Software/Option Configuration	3-7
3-8	Connectivity Installation Worksheet	3-8
3-9	Loading Base Image Software	3-9
3-10	Software Version check out	3-10
3-11	Paperwork	3-11

Section 3-2 Setup Reminders

3-2-1 Average Installation Time

Table 3-2 Average Installation Time

Description	Average Installation Time	Comments
Unpacking the scanner	0.5 hour	
Scanner wo/options	0.5 hour	Dependant on the configuration that is required
DICOM Option	0.5 hour	Dependant on the amount of configuration

The LOGIQ F Series has been designed to be installed and checked out by an experienced service technician in approximately 1 hour. LOGIQ F Series consoles with optional equipment may take slightly longer.

3-2-2 Installation Warnings

- 1.) Since the LOGIQ F Series weighs approximately 65 kg without options, preferably two people should unpack it. Two people are also preferable for installing any additional bulky items.
- 2.) 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.

NOTE: For information regarding packing labels, refer to LABELS ON PACKAGE.

- 3.) After being transported, the unit may be very cold or hot. If this is the case, allow the unit to acclimate before you turn it on. It requires one hour for each 2.5°C increment it's temperature is below 10°C or above 30°C.





CAUTION Equipment damage possibility. Turning the system on without acclimation after arriving at site may cause the system to be damaged.


Table 3-3 Acclimation Time


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


3-2-3 Safety Reminders


-  **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!**


-  **CAUTION** Two people should unpack the unit because of its weight. Two people are required whenever a part weighing 19kg (35 lb.) or more must be lifted.


-  **CAUTION** If the unit is very cold or hot, do not turn on its power until it has had a chance to acclimate to its operating environment.

-  **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 use a 20 Amp to 15 Amp adapter on the 120 Vac unit's power cord. This unit requires a dedicated 20 A circuit and can have a 15A plug if the on board peripherals do not cause the unit to draw more than 14.0 amps.

-  **CAUTION** Do not operate this unit unless all board covers and frame panels are securely in place. System performance and cooling require this.

-  **CAUTION** **OPERATOR MANUAL(S)**
The User Manual(s) should be fully read and understood before operating the LOGIQ F Series and kept near the unit for quick reference.

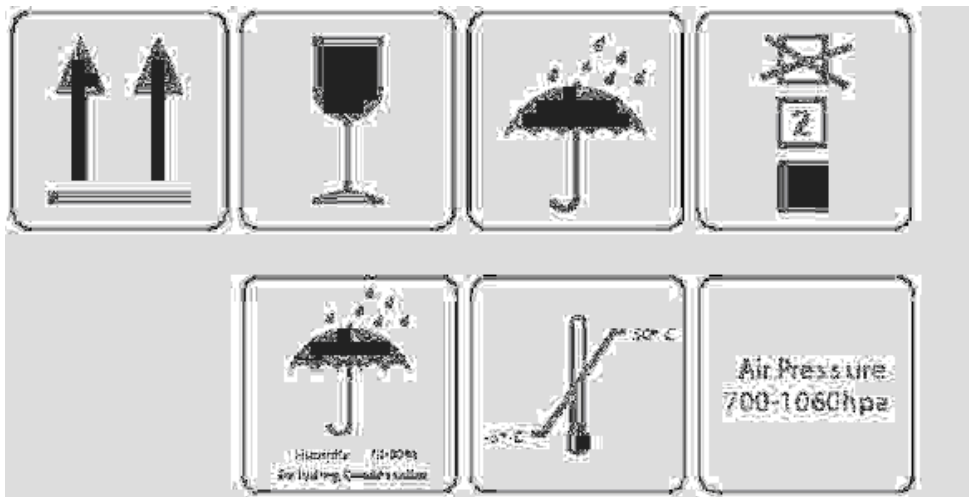


Figure 3-1 Environmental Labels

Section 3-3 Receiving and Unpacking the Equipment

When a new system arrives, check that any components are not damaged and are not in short supply. If shipping damage or shortage occurs, contact the address shown in Chapter 1.

 **CAUTION** Do not lift the unit by the Keyboard. Equipment damage may result.

 **CAUTION** The crate with the LOGIQ F Series weighs approximately 75kg. Be prepared for a sudden shift of weight as the unit is removed from its base (pallet)

Unpacking the the equipment

- 1.) Remove all the strapping tapes from the packing box.
- 2.) Remove the upper cover of the packing box and then rotate the knob to the right to open the packing box.
- 3.) Remove the PE bag and plastic film from the system.
- 4.) Remove Accessories Carton from the system.
- 5.) Remove the PE bag and plastic film from the syste
- 6.) Remove strapping tapes .
- 7.) Lift down the system .



Figure 3-2 Open the box

3-3-1 Moving into Position

 **CAUTION** Do not tilt the unit more than 5 degrees to avoid tipping it over. To avoid injury by tipping over. Set the monitor to the lowest position before moving.

In general, a single adult can move the LOGIQ F Series along an even surface with no steep grades. At least two people should move the machine when large humps, grooves, or grades will be encountered. (It is better to pull from the rear rather than push from the front of the unit). Before moving, store all loose parts in the unit. Wrap transducers in soft cloth or foam to prevent damage.

Although LOGIQ F Series is a mobile machine, two people should move it over rough surfaces or up and down grades.

3-3-2 Product Locator Installation Card

NOTE: *The Product Locator Installation Card shown may not be same as the provided Product Locator card.*

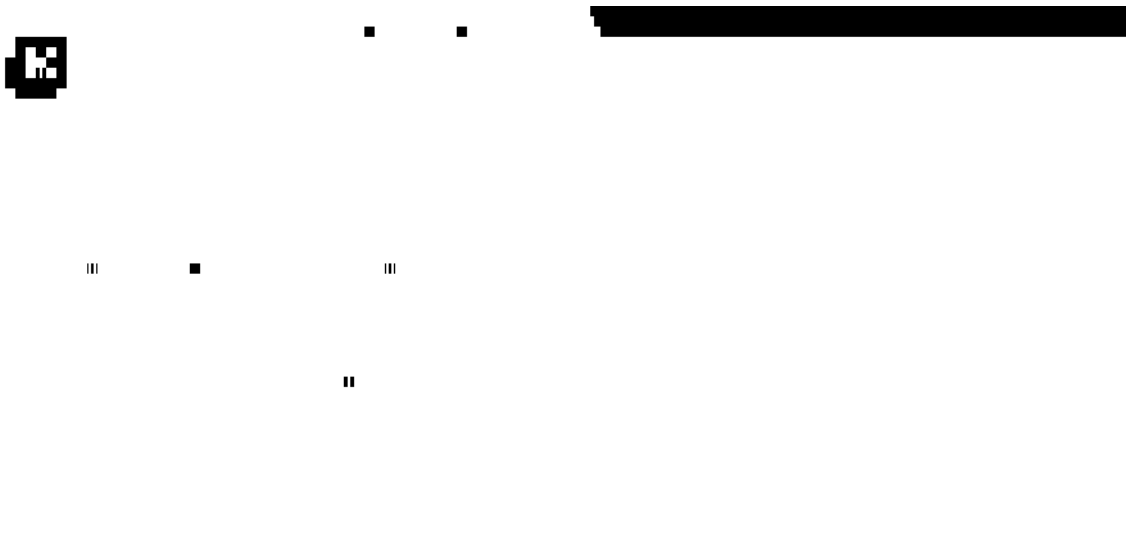


Figure 3-3 Product Locator Installation Card

Section 3-4 Preparing for Installation

3-4-1 Verify Customer Order

Compare items received by the customer to that which is listed on the delivery order. Report any items that are missing, back ordered or damaged.

3-4-2 Physical Inspection

3-4-2-1 System Voltage Settings

Verify that Docking Cart is set to the correct voltage.

The Voltage settings for the LOGIQ F Series is found on a label to the right of the Power switch and External I/O, on the rear of the system.



WARNING *Connecting a LOGIQ F Series to the wrong voltage level will most likely destroy it.*

3-4-2-2 Video Formats

Check that the video format is set to the locally used video standard, NTSC or PAL.

3-4-3 EMI Protection

This Unit has been designed to minimize the effects of Electro 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.

Section 3-5 Completing the Installation

3-5-1 Power On / Boot Up

NOTE: After turning off a system, wait at least ten seconds before turning it on again. The system may not be able to boot if power is recycled too quickly.

3-5-1-1 Scanner Power On

When power is applied to the scanner, power is distributed to the Cooling Unit, Control Panel, LCD, Peripherals and the Back-end Processor.

3-5-1-2 Turn on the system

Press the **Power On/Off** switch at the front of the system once.



Figure 3-4 Power On/Off Switch

When the **Power On/Off** switch on the Control Panel is pressed once, the Back-end Processor starts and the software code is distributed to initiate the scanner.

No status messages are displayed during this process.

3-5-2 Power Off/ Shutdown

NOTE: After turning off a system, wait at least ten seconds before turning it on again. The system may not be able to boot if power is recycled too quickly.

3-5-2-1 Back-end Processor Power Down

To power down the system:

- 1.) Press the **Power On/Off** switch once.

3-5-2-1 Back-end Processor Power Down (cont'd)

2.) The System-Exit window is displayed.

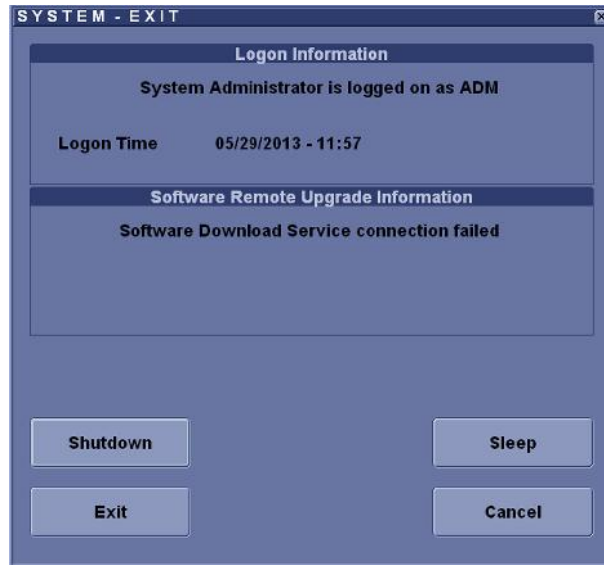


Figure 3-5 System Exit Window

- 3.) Using the Trackball or Select key, select Shutdown.
- 4.) The shutdown process takes a few seconds and is complete when the power status LED is turned blue.
- 5.) Disconnect the probes. Clean or disinfect all probes as necessary. Store them in their shipping cases to avoid damage.

3-5-2-2 Scanner Shutdown

Disconnect the Mains Power Cable if necessary. *For example:* Relocating the scanner.

3-5-3 Transducer Connection

1.) Plug the probe connector into the probe port, then lock the probe.

NOTE: Please ensure that the probe latch is in an unlocked position before you connect the probe to the system.

NOTE: It is not necessary to turn OFF power to connect or disconnect a probe.

Section 3-6 System Configuration

3-6-1 System Specifications

3-6-1-1 Physical Dimensions

The physical dimensions of the LOGIQ F Series unit are summarized in [Table 3-4 on page 3-10](#) .
The Size of LOGIQ F Series.

Table 3-4 Physical Dimensions of LOGIQ F Series

Height	Width	Depth	Unit
1450	720	800	mm
57.09	28.35	31.50	inches

3-6-1-2 Weight

Table 3-5 Weight of LOGIQ F Series With Monitor and Without Other Peripherals

Model	Weight [kg]	Weight [lb]
LOGIQ F Series	Approximately 65	Approximately 144

3-6-2 Electrical Specifications

Table 3-6 Electrical Specifications for LOGIQ F Series

System	Voltage	Current	Frequency
LOGIQ F Series	100 -240 V AC	400VA	50/60Hz

3-6-3 On-Board Optional Peripherals

Table 3-7 List of Optional Peripherals

B/W Printer	SONY	UP-D897MD	USB
B/W Printer	SONY	UP-D898MD	USB
B/W Printer	SONY	UP-D711MD	USB
HP Printer	HP	HP Officejet 100	USB
HP Printer	HP	HP Officejet Pro 8100	USB
USB Memory	SanDisk	SanDisk 4G	USB
1-Pedal Footswitch	Whanam	FSU1000	USB
3-Pedal Footswitch	Whanam	MKF 2-MED GP26	USB
USB Hard Disk	Seagate	USB HDD 1T	USB
Color Printer	SONY	UP-D25MD	USB
ECG	NORAV	ECG -USB1	USB

3-6-4 Connecting Cables



WARNING Equipment damage possibility. Be sure to use the following recommended connecting cables to connect recording devices and a network with LOGIQ F Series console.

3-6-5 Peripherals/Accessories Connector Panel

LOGIQ F Series peripherals and accessories can be properly connected using the side connector panel.

3-6-5-1 Rear Panel Connector

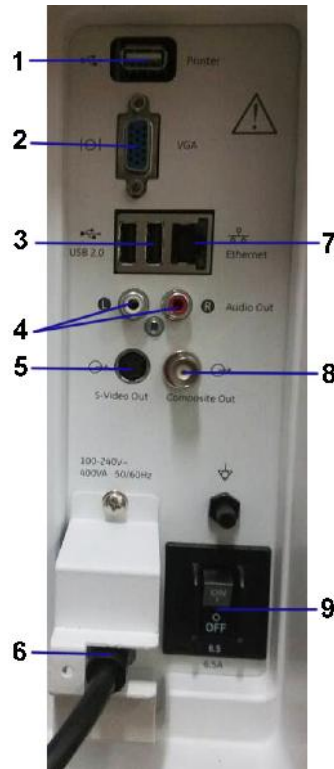


Figure 3-6 Rear Connector Panel

Table 3-8 Peripheral/Accessory Connector Panel

1	Isolated USB port	For AC Printer ONLY
2	VGA port	VGA Video Out
3	USB port	USB 2.0
4	Audio	Audio Line Out
5	S-Video port	S-Video Out
6	AC Inlet	100-240V
7	Ethernet	LAN for InSite Connection (RJ45)
8	Composited port	Composited Video Out
9	Circuit breaker	6.5A

NOTE: The AC printer can be connected to the isolated USB port on the rear panel only.

NOTE: There is only one isolated USB port on the system as shown above.

3-6-5-2 Pin assignment for each connector

Table 3-9 Pin Assignments of External VGA

Pin No.	Signal	Pin No.	Signal
1	RED	9	NC
2	GREEN	10	NC
3	BLUE	11	NC
4	NC	12	NC
5	NC	13	HSY
6	GND	14	VSX
7	GND	15	NC
8	GND		

Table 3-10 Pin Assignments of USB

Pin No.	Signal	Pin No.	Signal
1	+5 VDC	5	+5 VDC
2	DATA	6	DATA
3	DATA	7	DATA
4	GND	8	GND

Table 3-11 Pin Assignments of Audio

Pin No.	Signal	Pin No.	Signal
1	GND	4	NC
2	L+	5	R+
3	Speaker L	6	Speaker R

Table 3-12 Pin Assignment of S-Video

Pin No.	Output Signal	Pin No.	Output Signal
1	GND	3	Y
2	GND	4	C

Table 3-13 Pin Assignment of Composite Video Out

Pin No.	Output Signal	Pin No.	Output Signal
1	Composite Out	2	GND

3-6-5-3 Connect Peripherals

A.) Connect B/W printer to the system.

UP-D711MD Printer can be properly connected using USB Ports.



Figure 3-7 Connect B/W printer to the system

Sony UP-D711MD Printer is connected to the LOGIQ F Series system via the USB port on the USB hub under the control panel.

NOTE: The DC printer can only be connected to the system via the DC power port and the USB port on the rear side of the USB hub as shown below.



Figure 3-8 Power and USB Ports for DC printer

- 1.) DC Power Port
- 2.) USB Port

3-6-5-3 Connect Peripherals (cont'd)

- B.) Connect UP-D25MD color printer to the system. UP-D25MD Color Printer can be properly connected using the isolated USB Port. And connect the power cable of UP-D25MD to the wall outlet.



Figure 3-9 Connect color printer to the system

- C.) Connect the B/W printer (Sony UP-897/UP-D898MD) to the system
The B/W printer can be properly connected using the isolated USB Port. And connect the power cable of Sony UP-D897/UP-D898MD to the wall outlet.



Figure 3-10 Connect B/W Printer (Sony UP-897) to the system

3-6-5-3 Connect Peripherals (cont'd)

D.) Connect Foot Switch to the system.

Foot Switch can be properly connected using USB Ports.



1-Pedal Footswitch



3-Pedal Footswitch

Figure 3-11 Connect Foot Switch to the system

E.) Connect the USB Memory to the system. The USB Memory can be properly connected using USB ports.



Figure 3-12 USB Memory Connection

3-6-5-3 Connect Peripherals (cont'd)

F.) ECG can be properly connected using USB ports.



Figure 3-13 ECG Connection

G.) Connect HP Officejet 100 printer to the system. HP Officejet 100 Printer can be properly connected using the isolated USB Port. And connect the power cable of HP Officejet 100 to the wall outlet.



Figure 3-14 HP Officejet 100 printer to the system

H.) Connect the USB HDD to the system. The USB Harddisk can be properly connected using USB ports.



Figure 3-15 USB Hard Disk Connection

3-6-5-4 Digital Printer Setup

There are two steps to do when setting up a digital printer: 1. follow the procedure below for each printer, then 2. set up specific properties for each printer if you need.

Follow this procedure for each printer:

- 1.) Select Utility--> Connectivity--> Service. Add the Standard Print.



Figure 3-16 Add the Printer

- 2.) Highlight Standard Print in the Service list. Select the printer from the Printer pull-down Properties menu. For the UP-D897 printer, select "Portrait" as orientation. 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. Press **Save**.

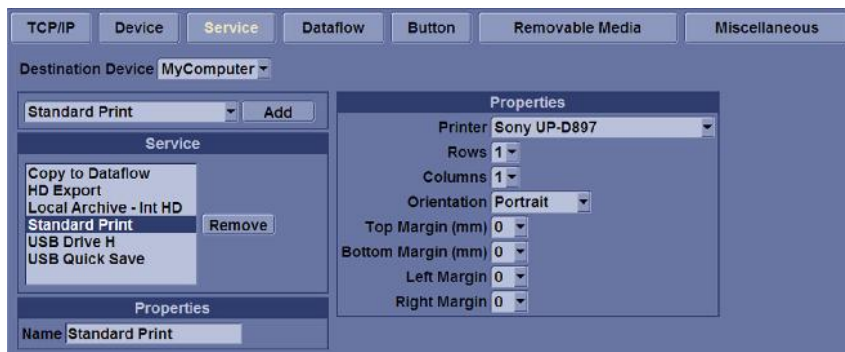


Figure 3-17 Select the Printer

- 3.) Select **Button**. Select the appropriate print key (Print1, Print2...) from the Physical Print Buttons section. Select the printer from the MyComputer column and press >> to move it to the Printflow View column. Press **Save**.

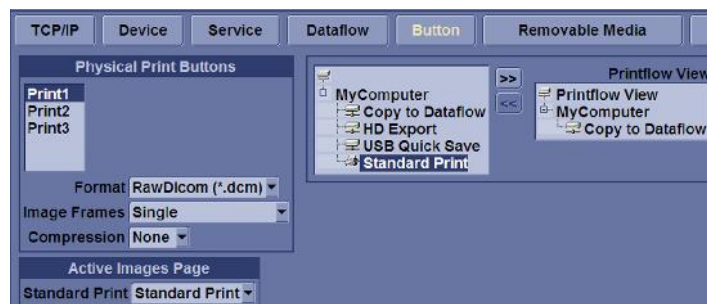


Figure 3-18 Select Button

3-6-5-5 Digital Printer Instructions

Follow these steps to set up the paper size of the printer, take Sony UP-D897 as an example.

- 1.) Press Utility-->System-->Peripherals. Select the UP-D897 from the pull-down menu under Standard Printer Properties. Click **Properties**.



Figure 3-19 Properties

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



Figure 3-20 Properties

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

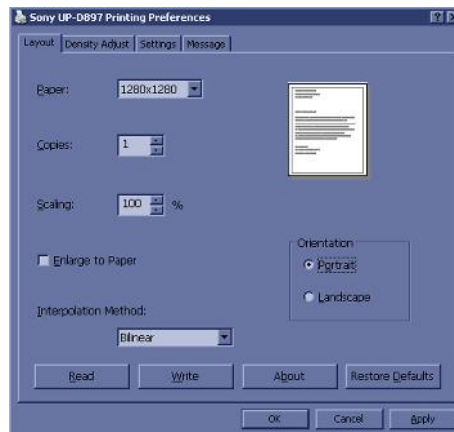


Figure 3-21 Printing Preferences

- 4.) Select Paper Size. Press **Apply**. Press **OK**.
- 5.) Press **Save**, then **Exit**.

3-6-6 Available Probes

See in specification in the LOGIQ F Series User Reference Manual for Probes and intended use.

Table 3-14 List of Probes on LOGIQ F Series

Probe Name	Material of Headshell	Area of Using	TYPE	Catalog Number	Part Number
4C-RS	NORYL	Abdomen Obstetrics Gynecology Pediatrics Urology Biopsy	CONVEX	H4000SR	5451471
8C-RS	VALOX	Abdomen Pediatrics Cardiac	CONVEX	H40402LS	5434194
E8C-RS	VALOX	Obstetrics Gynecology Urology Endocaviy Biopsy	CONVEX		5409293
3Sc-RS	VALOX	Abdomen Transcranial Pediatrics Cardiac Biopsy	Sector		47237516
L6-12-RS	VALOX	Small Parts Vascular Pediatrics Musculoskeletal Biopsy	LINEAR		5454332
RAB2-6-RS	NORYL	Abdomen Obstetrics Gynecology Urology Biopsy	4D		KT2302893

Section 3-7 Software/Option Configuration

Refer to the LOGIQ F Series Basic User Manual, Chapter 16, Customizing Your System for information on configuring items like Hospital, Department, Language, Units (of measure), Date, Time and Date Format.

For information on configuring Software Options, Refer to the LOGIQ F Series Basic User Manual, Chapter 16, Customizing Your System.

For information on configuring DICOM Connectivity, Refer to the LOGIQ F Series Basic User Manual, Chapter 16, Customizing Your System.

Section 3-8 Connectivity Installation Worksheet

Site System Information				
Site: <input style="width: 90%;" type="text"/>	Floor: <input style="width: 85%;" type="text"/>	Comments: <div style="border: 1px solid black; height: 80px; width: 100%;"></div>		
Dept: <input style="width: 90%;" type="text"/>	Room: <input style="width: 85%;" type="text"/>			
LOGIQ SN: <input style="width: 80%;" type="text"/>	Type: <input style="width: 80%;" type="text"/>	REV: <input style="width: 80%;" type="text"/>		
CONTACT INFORMATION				
Name	Title	Phone	E-Mail Address	
<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	
<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	
<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	
<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	

TCP/IP Settings	
Name - AE Title: <input style="width: 95%;" type="text"/>	
IP Settings IP Address: <input style="width: 95%;" type="text"/> Subnet Mask: <input style="width: 95%;" type="text"/> Default Gateway: <input style="width: 95%;" type="text"/>	Remote Archive Setup Remote Archive IP: <input style="width: 95%;" type="text"/> Remote Archive Name: <input style="width: 95%;" type="text"/>

Services (Destination Devices)						
	Device Type	Manufacturer	Name	IP Address	Port	AE Title
1	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>
2	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>
3	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>
4	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>
5	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>
6	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>
7	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>
8	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>
9	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>
10	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>
11	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>
12	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>

Section 3-9 Loading Base Image Software

Refer to

[Section 8-4 "Loading Base Image Software" on page 8-5.](#)

Section 3-10 Software Version check out

3-10-1 Functional Check-out

- 1.) Power on LOGIQ F Series scanner and wait until system booting to main screen.
- 2.) Select **Utility** on control panel or touch panel.
- 3.) Select **About** on screen or touch panel.

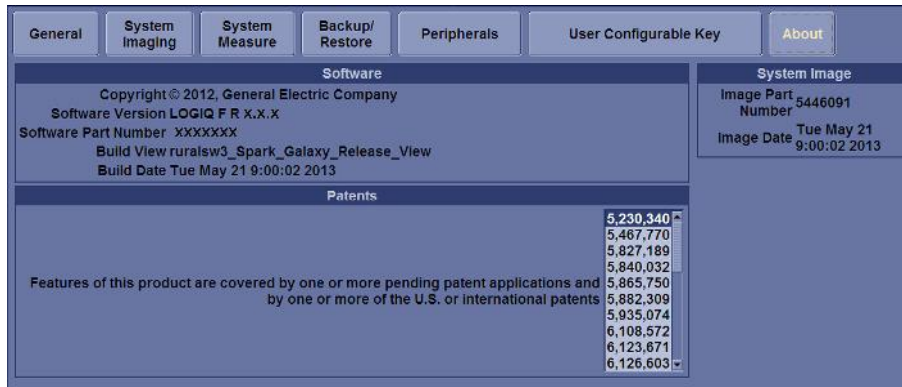


Figure 3-22 About and Software version

Section 3-11 Paperwork

NOTE: *During and after installation, the documentation (i.e. User Manuals, Installation Manuals...) 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.*

3-11-1 Product Locator Installation

NOTE: *The Product Locator Installation Card shown may not be same as the provided Product Locator card.*

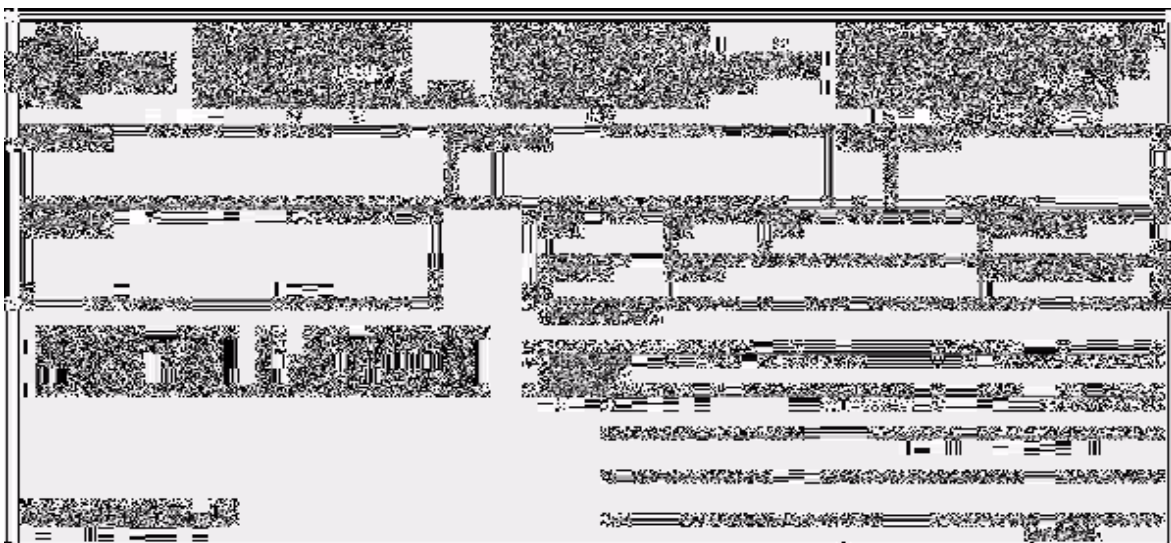


Figure 3-23 Product Locator Installation Card

3-11-2 User Manual(s)

User 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.

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Chapter 4

Functional Checks

Section 4-1 Overview

4-1-1 Purpose for Chapter 4

This chapter provides procedures for quickly checking major functions of the LOGIQ F Series console, diagnostics by using the built-in service software, and power supply.

Table 4-1 Contents in Chapter 4

Section	Description	Page Number
4-1	Overview	4-1
4-2	Required Equipment	4-1
4-3	General Procedure	4-2
4-4	Software Configuration Checks	4-33
4-5	Peripheral Checks	4-33

Section 4-2 Required Equipment

To perform these tests, you'll need any of the sector, linear, or convex transducers.
(normally you should check all the transducers used on the system)

Section 4-3 General Procedure

 **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.

4-3-1 Power On/Boot Up

After connect the system to the electrical supply, the power is applied to the scanner. When the Control panel **Power On/Off** key is pressed once, the System starts.

4-3-1-1 Scanner Power On

When power is applied to the scanner, power is distributed to the Cooling Unit, Control Panel, LCD, Peripherals and the Back-end Processor.

4-3-1-2 Turn on the system

Press the **Power On/Off** switch at the front of the system once.



Figure 4-1 Power On/Off Switch

When the **Power On/Off** switch on the Control Panel is pressed once, the Back-end Processor starts and the software code is distributed to initiate the scanner.

No status messages are displayed during this process.

4-3-2 Power Off/ Shutdown

NOTE: After turning off a system, wait at least ten seconds before turning it on again. The system may not be able to boot if power is recycled too quickly.

4-3-2-1 Back-end Processor Power Down

To power down the system:

- 1.) Press the **Power On/Off** switch at the front of the system once.
- 2.) The System-Exit window is displayed.

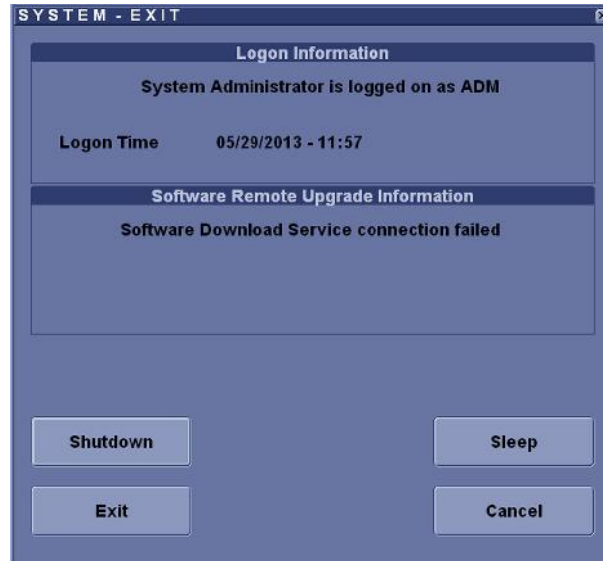


Figure 4-2 System Exit Window

- 3.) Using the Trackball or Select key, select Shutdown.
- 4.) The shutdown process takes a few seconds and the power off sequence is complete when the power status LED is turned amber.
- 5.) Disconnect the probes. Clean or disinfect all probes as necessary. Store them in their shipping cases to avoid damage.

4-3-2-2 Scanner Shutdown

Disconnect the Mains Power Cable is necessary. *For example:* Relocating the scanner.



CAUTION DO NOT unplug and/or transport the unit until after the power off sequence has been completed. Failure to do so may result in corrupted patient files.

4-3-2-3 Check System Date and Time

A warning message "Please check the system date and time are correct" appears on the screen when the system is powered on. This warning message appears for the possible reasons:

- The system is not boot up for over 14 days.
- The system time has been changed by 24 hours earlier than the current system time of last boot-up.

This warning message is to remind the user to check the system date in case the system date and time is incorrect.

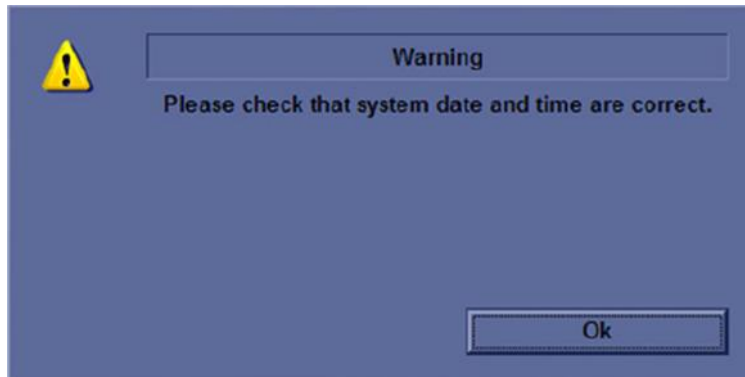


Figure 4-3 Check system date and time message

Move the cursor to **OK** and press **Cursor** key on the control panel to select **OK**. The system enters scanning mode.

Check the system date and time. If it is incorrect, follow below steps to reset the system date and time.

- 1.) Enter Utility -> System -> General -> Date/Time.
- 2.) Reset the system date and time.
- 3.) Select **Apply** and then select **OK**.
- 4.) Select **Save**.

4-3-3 Archiving and Loading Presets

NOTE: Always save presets before any software reload. This ensures the presets loaded after the software reload are as up-to-date as possible.

All user presets except changes to Summary, Anatomy, and Biometry pages, can be saved on an CD-R disk (or USB memory device) for reloading on the system.

NOTICE Presets should NOT be saved on the same CD-R disk (or USB memory device) as images. The Archive Menu lists the images but does NOT list the presets stored on a CD-R disk (or USB memory device).

4-3-3-1 Archiving Presets to an CD-R Disk (or USB memory device)

- 1.) Insert an empty (blank) CD-R disk into the DVD-RW.
- 2.) Access the **Utility** Menu, and select **System**. The Backup sheet will be shown on the LCD display.

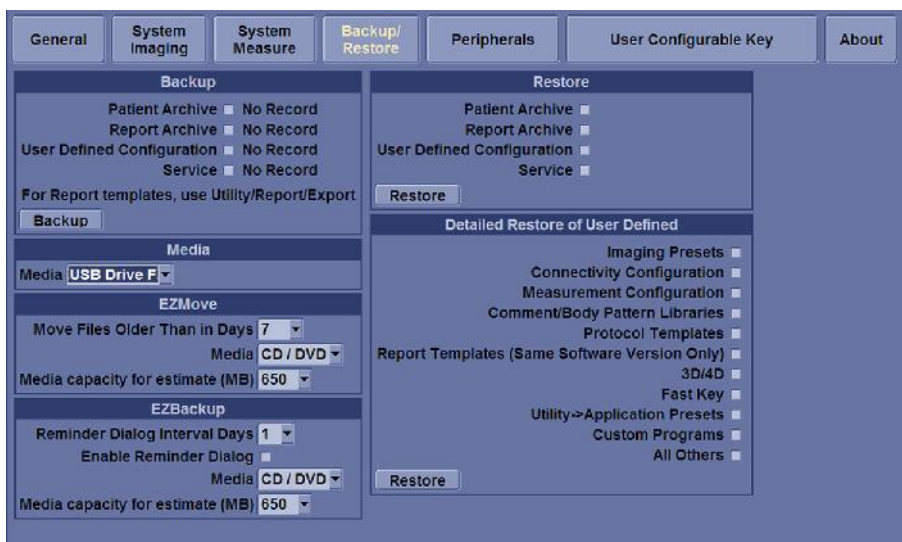


Figure 4-4 Backup Sheet

- 3.) Select the item to back up either from Resource Files.
- 4.) Enter backup destination or browse through the disk to locate the destination.
- 5.) Select Backup now. The backup status for each item is displayed on the Result column.

4-3-3-2 Loading Presets from an CD-R disk (or USB memory device)

- 1.) Insert the CD-R disk with the archived Presets into the DVD-RW.
- 2.) Access to the Utility Menu, and select System. The Restore sheet will be shown on the LCD display.
- 3.) Select the item to restore either from Resource Files.
- 4.) Enter restore destination or browse through the disk to locate the destination.
- 5.) Select Restore. The restore status for each item is displayed on the Result column.

4-3-4 Adjusting the Display Monitor

Please refer to [Section 6-2 "Monitor Adjustments" on page 6-2](#)

4-3-5 System Features

4-3-5-1 Control Panel

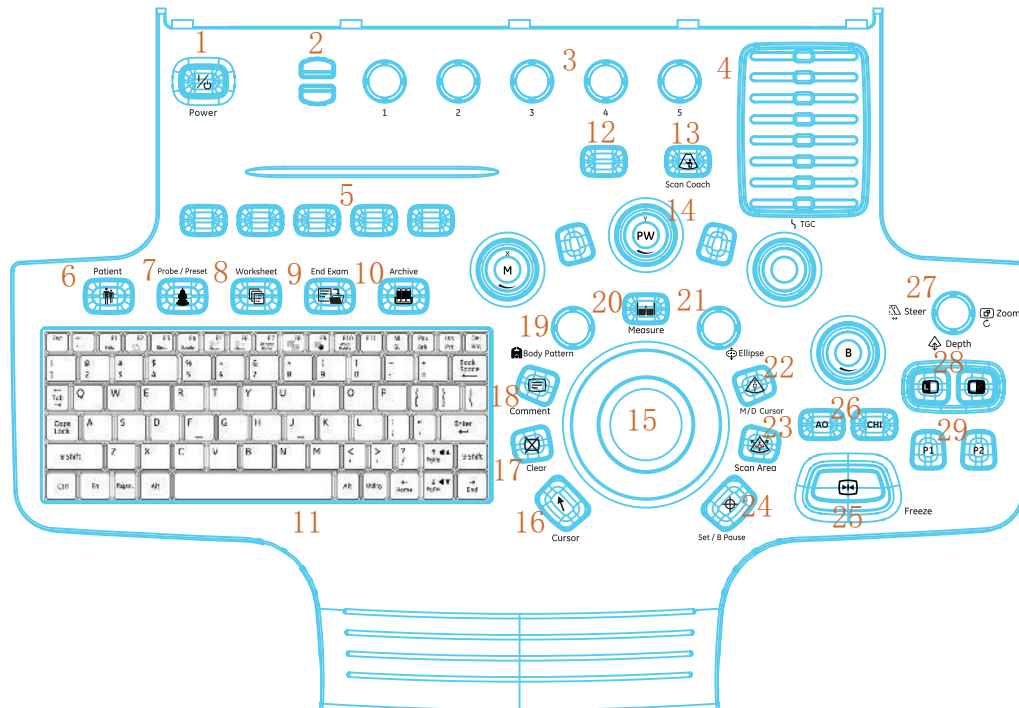


Figure 4-5 Control Panel Tour

1. Power On/Off	11. A/N Keyboard	22. M/D Cursor key
2. Page Up/Down keys	12. 4D (option)	23. Scan Area key
3. Rotary Button	13. Scan Coach	24. Set/B Pause key
4. TGC	14. Mode/Gain/XYZ Controls	25. Freeze key
5. User Defined keys	15. Trackball	26. AO and CHI keys
6. Patient key	16. Cursor key	27. Steer/Zoom/Depth key
7. Probe/Preset keys	17. Clear key	28. Left/Right key
8. Worksheet key	18. Comment key	29. P1 and P2 keys
9. End Exam key	19. Body Pattern key	
10. Archive key	20. Measure key	
	21. Ellipse key	

NOTE: CWD, PDI, 4D, CF and touch panel are not supported on LOGIQ F3.

4-3-5-2 LOGIQ F Series SoftMenu Key Tour

- 1.) Page Up/Down key: To turn the menu page up and down.
- 2.) Rotary key: Rotate to adjust the menuMonitor Display

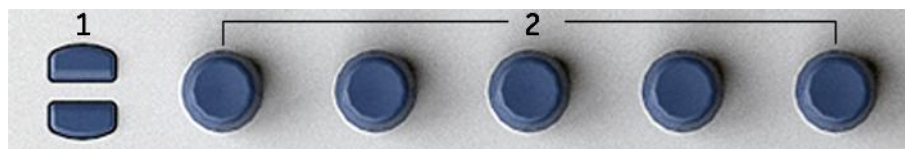


Figure 4-6 SoftMenu Key Tour

4-3-5-3 Touch Panel (Option)

NOTE: Touch panel is an option, and it is not supported on LOGIQ F3.

Touch Panel contains exam function and mode/function specific controls.

a.) Exam Function Controls

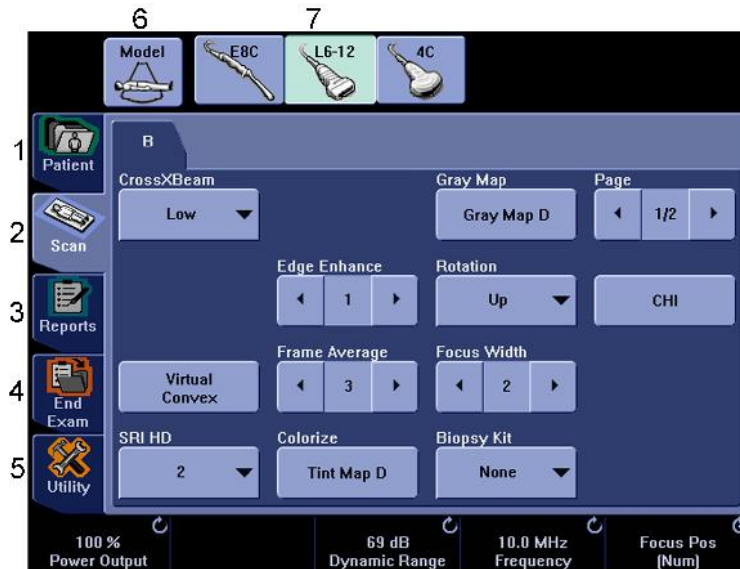


Figure 4-7 Exam Function Controls

- 1.) Patient: Enters Patient screen
- 2.) Scan: Enters scanning mode screen
- 3.) Reports: Activates default report and Touch Panel of report choices.
- 4.) End Exam: Activates Image Management and Touch panel with end of exam options.
- 5.) Utility: Activates system configuration menus.
- 6.) Model: Selects the application to use.
- 7.) Probe Indicator: Indicates and selects the probes.

NOTE: Different menus are displayed depending on which touch panel is selected.

At the bottom of the Touch panel, there are five joystick rotaries. The functionality of these rotaries changes, depending upon the currently-displayed menu. Press the button to switch between parameters, activate/disable functions or adjust the parameter. Rotate the dial to adjust the parameter.

4-3-5-3 Touch Panel (Option) (cont'd)

b.) Mode/Function Specific Controls

In general, the key name is indicated at the top of the key. There are different types of Touch panel keys as illustrated below:

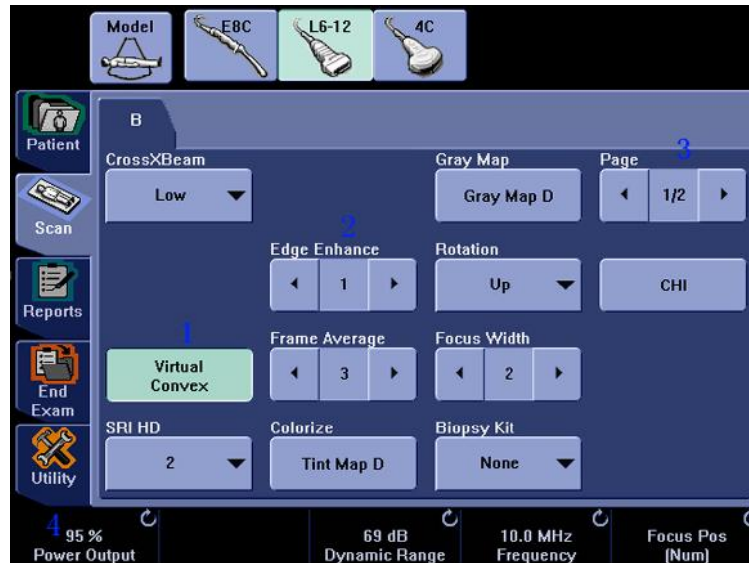


Figure 4-8 Mode/Function Specific Controls

- 1.) Press to toggle control on/off.
- 2.) Progress/Select keys are used for controls that have three or more choices.
- 3.) Press to move to the next Touch panel page.
- 4.) Parameters which can be adjusted by rotaries knobs.

4-3-5-4 Monitor Display

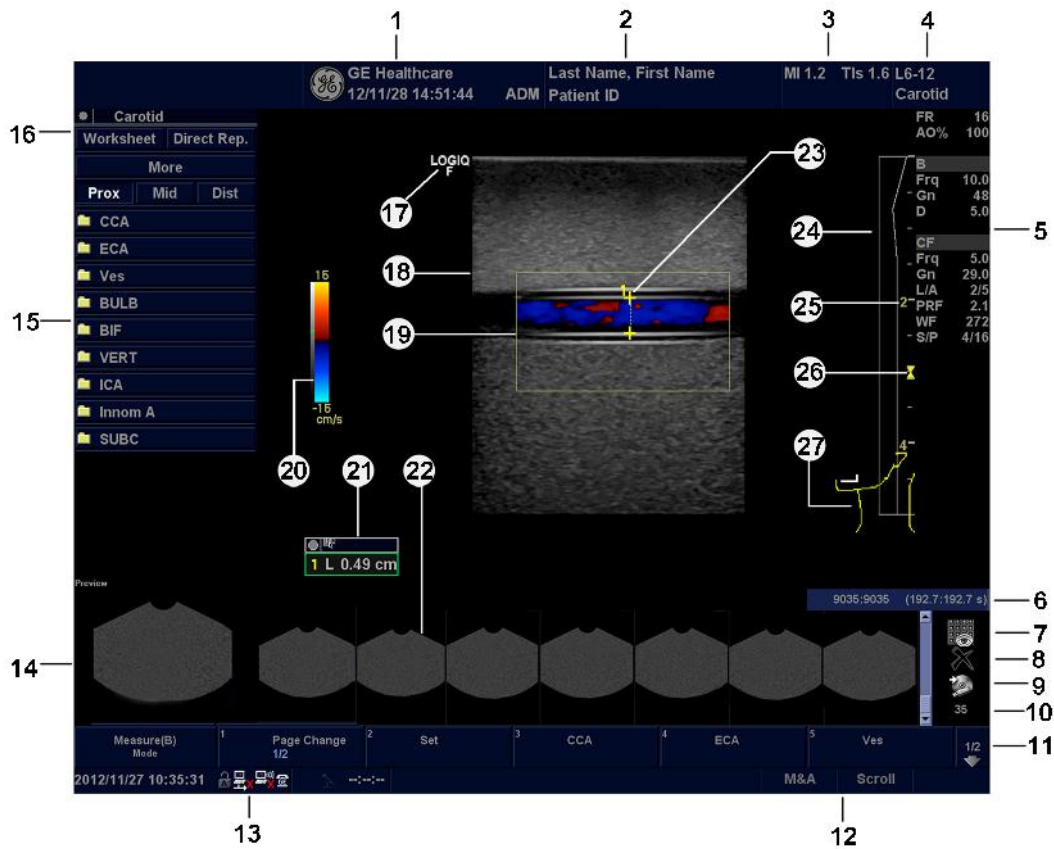


Figure 4-9 Monitor Display Tour

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Institution/Hospital Name, Date, Time, Operator Identification. 2. Patient Name, Patient Identification. 3. Power Output Readout. 4. Probe Identifier. Exam Preset. 5. Imaging Parameters by Mode. 6. Cine Gauge. 7. Active Images screen. 8. Delete Image. 9. Save As Menu. 10. Number of Images in Exam. 11. Page Indication. 12. Trackball Functionality Status. 13. Current date and time, Caps Lock: (lit when on), network connection indicator (PC=connected, PC with X=not connected), system messages display, InSite status, InSite controls. Image Preview | <ol style="list-style-type: none"> 14. Image Preview. 15. Measurement Summary Window. 16. Worksheet/Direct Report. 17. Probe Orientation Marker. 18. Image. 19. Region of interest. 20. Gray/Color Bar. 21. Measurement Results Window. 22. Image Clipboard. 23. Measurement Calipers. 24. TGC. 25. Depth Scale. 26. Focal Zone Indicator. 27. Body Pattern. |
|--|--|

4-3-6 B Mode Checks

4-3-6-1 Preparations

- 1.) Connect one of the probes listed in 3-6-6 "Available Probes" on page 3-19, in Chapter 3 Installation to the System probe connector.
- 2.) Turn ON the scanner (if it isn't turned on already).



Figure 4-10 Controls available in B Mode



Figure 4-11 B Mode Screen Picture Example

4-3-6-2 B Mode OP Panel Controls

Table 4-2 B Mode Controls

Control	Possible Bioeffect	Description/Benefit
Depth	Yes	Depth controls the distance over which the B-Mode images anatomy. To visualize deeper structures, increase the depth. If there is a large part of the display which is unused at the bottom, decrease the depth.
Gain	No	B-Mode Gain increases or decreases the amount of echo information displayed in an image. It may have the effect of brightening or darkening the image if sufficient echo information is generated.
Focus	Yes	Increases the number of focal zones, moves the focal zone(s) and change the zone width 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.
Auto Optimize	No	Auto Optimize (Auto) lets you optimize the image based upon a the actual B Mode image data (Auto Tissue Optimize, ATO). The preset levels (Low, Medium, and High) allow you to pick a preference for the contrast enhancement in the resulting image. Low does the least amount of contrast enhancement, high does the most. Auto is available in single or multi image, on live, frozen or CINE images (in B-Mode only), and while in zoom and in Spectral Doppler. Auto in PW Doppler Mode(ASO) optimizes the spectral data. Auto adjusts the Velocity Scale/PRF (live imaging only), baseline shift, dynamic range, and invert (if preset). Upon deactivation, the spectrum is still optimized.
Mode Cursor	No	Displays the M/D-Mode cursor on the B-Mode image.
CrossXBeam	Yes	CrossXBeam is the process of combining three or more frames from different steering angles into a single frame. CrossXBeam is available on Convex and Linear probes. CrossXBeam combines multiple co-planar images from different view angles into a single image at real-time frame rates, using bi-cubic interpolation.
Tissue Harmonic Imaging (THI)	Yes	Enhances image resolution and improved small parts imaging.
Frequency	Yes	Multi Frequency mode lets you downshift to the probe's next lower frequency or shift up to a higher frequency.
Steer	Yes	You can slant the B-Mode or Color Flow linear image left or right to get more information without moving the probe. The angle steer function only applies to linear probes.
Virtual Convex	Yes	On Linear and Sector probes, Virtual Convex provides a larger field of view in the far field.
TGC	No	TGC amplifies returning signals to correct for the attenuation caused by tissues at increasing depths. TGC slide pots are spaced proportionately to the depth. The area each pot amplifies varies as well. A TGC curve may appear on the display (if preset), matching the controls that you have set (except during zoom). You can choose to deactivate the TGC curve on the image.

Table 4-2 B Mode Controls

Control	Possible Bioeffect	Description/Benefit
Width	Yes	You can widen or narrow the size of the sector angle to maximize the image's region of interest (ROI).
Tilt	Yes	You can steer the sector angle to get more information without moving the probe while in B-Mode, M-Mode, Doppler Mode, and Color Flow Mode.
Reverse	No	Flips the image 180 degrees left/right.
Dynamic Range	No	Dynamic Range controls how echo intensities are converted to shades of gray, thereby increasing the adjustable range of contrast.
Line Density	Yes	Optimizes B-Mode frame rate or spatial resolution for the best possible image.
Map	No	The system supplies B, M, and Doppler Mode system maps.
Frame Average	No	Temporal filter that averages frames together, thereby using more pixels to make up one image. This has the effect of presenting a smoother, softer image.
Colorize	No	Colorize is the colorization of a conventional B-Mode image or Doppler Spectrum to enhance the user's ability to discern B, M, and Doppler Mode intensity valuations. Colorize is NOT a Doppler Mode. NOTE: You can colorize realtime or CINE images or Timeline CINE. Colorizes the gray scale image to enhance the eye's discrimination capability. Spectrum Colorize colorizes the spectrum as a function of power using the inverse of the Colorize map for the signal intensity in each Doppler line. Colorize enhances the visibility of the spectrum's characteristics and enhances your ability to identify spectral broadening and the edge contours of the spectrum used to define the peak frequency/velocity. The colorize bar displays while Colorize is activated.
Edge Enhance	No	Edge Enhance brings out subtle tissue differences and boundaries by enhancing the gray scale differences corresponding to the edges of structures.
Rotation	No	You can flip the image up/down. CAUTION: When reading an rotated image, be careful to observe the probe orientation to avoid possible confusion over scan direction or left/right image reversal.
Rejection	No	Selects a level below which echoes will not be amplified (an echo must have a certain minimum amplitude before it will be processed).
Suppression	No	Suppresses the noise in the image.

Table 4-2 B Mode Controls

Control	Possible Bioeffect	Description/Benefit
SRI-HD	No	<p>SRI-HD (Speckle Reduction Imaging High Definition) is an adaptive algorithm to reduce the unwanted effects of speckle in the ultrasound image. Image speckle usually appears as a grainy texture in otherwise uniform areas of tissue. Its appearance is related to image system characteristics, rather than tissue characteristics, so that changes in system settings, such as probe type, frequency, depth, and others, can change the appearance of the speckle. Too much speckle can impair image quality and make it difficult to see the desired detail in the image. Likewise, too much filtering of speckle can mask or obscure desired image detail. Extra care must be taken to select the optimal SRI-HD level. SRI-HD is available in 2D imaging and may be used with any transducer or clinical application when image speckle appears to interfere with the desired image detail.</p>
LOGIQView (Option)	No	<p>LOGIQView provides the ability to construct and view a static 2D 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.</p> <p>LOGIQView constructs the extended image from individual image frames as the operator slides the transducer along the surface of the skin in the direction of the scan plane. The quality of the resulting image is somewhat user-dependent and requires some additional skill and practice to develop proper technique and become fully proficient.</p> <p>LOGIQView is not available for the following: Multi Image, Timeline Modes, Color Flow Mode or PDI Mode.</p>

4-3-7 M Mode Controls

4-3-7-1 Preparations

- 1.) Connect one of the probes listed in 3-6-6 "Available Probes" on page 3-19, in Chapter 3 Installation to the System probe connector.
- 2.) Turn ON the scanner (if it isn't turned on already).



Figure 4-12 Controls available in M Mode



Figure 4-13 M Mode Screen Picture Example

4-3-7-2 M Mode Controls

Table 4-3 M Mode Controls

Control	Possible Bioeffect	Description/Benefit
Sweep Speed	No	Changes the speed at which the timeline is swept. Available in M-Mode, Doppler Mode and M Color Flow Mode.
Anatomical M-Mode (option)	Yes	Anatomical M-Mode gives you the ability to manipulate the cursor at different angles and positions. The M-Mode display changes according to a motion of the M cursor.

4-3-8 Doppler Mode Checks

4-3-8-1 Preparations

- 1.) Connect one of the probes listed in [3-6-6 "Available Probes"](#) on page 3-19, in Chapter 3 Installation to the System probe connector.
- 2.) Turn ON the scanner (if it isn't turned on already).



Figure 4-14 Controls available in Doppler Mode



Figure 4-15 Doppler Mode Screen Picture Example

4-3-8-2 Doppler Mode Controls

Table 4-4 Doppler Mode Controls

Control	Possible Bioeffect	Description/Benefit
Auto Spectral Optimize [ASO] (Auto)	Yes	Auto in Doppler Mode optimizes the spectral data. Auto adjusts the Velocity Scale/PRF (on live images only), baseline shift, Dynamic Range and invert (if preset). The benefit of Auto can be found in reduced optimization time and a more consistent and accurate optimization process.
Update	Yes	Toggles between simultaneous and update presentation while viewing the timeline.
Doppler sample volume gate position (Trackball)	Yes	Moves the sample volume gate on the B-Mode's Doppler Mode cursor. The gate is positioned over a specific position within the vessel.
Doppler sample volume length	Yes	Sizes the sample volume gate.
Scale (Velocity Scale)	Yes	Adjusts the velocity scale to accommodate faster/slower blood flow velocities. Velocity scale determines pulse repetition frequency. If the sample volume gate range exceeds single gate Scale capability, the system automatically switches to high PRF mode. Multiple gates appear, and HPRF is indicated on the display.
Angle Correct	No	Estimates the flow velocity in a direction at an angle to the Doppler vector by computing the angle between the Doppler vector and the flow to be measured. <i>NOTE: When the Doppler Mode Cursor and angle correct indicator are aligned (the angle is 0), you cannot see the angle correct indicator.</i>
Quick Angle	No	Quickly adjusts the angle by 60 degrees.
Wall Filter	No	Insulates the Doppler signal from excessive noise caused from vessel movement.
Baseline	No	Adjusts the baseline to accommodate faster or slower blood flows to eliminate aliasing.
Mode Cursor	No	Displays the Doppler Mode cursor on the B-Mode image.
Steer and Fine Steer	Yes	You can slant the ROI of the Color Flow linear image left or right to get more information without moving the probe. The angle steer function only applies to linear probes.
Volume	No	Controls audio output.
Invert	No	Vertically inverts the spectral trace without affecting the baseline position.
Compression	No	Dynamic range controls how echo intensities are converted to shades of gray, thereby increasing the range of contrast you can adjust.
Trace Method	No	Traces the average mean and peak velocities in realtime or frozen images.
Cycles to Average	No	The average value over a number of cycles (from 1-5).
Trace Sensitivity	No	Adjust the trace to follow the waveform for signal strength.
Trace Direction	No	Specifies trace direction.

Table 4-4 Doppler Mode Controls

Control	Possible Bioeffect	Description/Benefit
Display Format	No	Changes the horizontal/vertical layout between B-Mode and M-Mode, or timeline only.
Modify Auto Calcs	No	Activates the menu to select which calculations are automatically calculated.
Auto Calcs	No	Activates the calculation automatically which you select in the Modify Auto Calculation when the system is in a state of freeze or live.
Simultaneous	Yes	Simultaneous allows two modes or three modes to be active at the same time. For example, both B-Mode and PW Modes are active, or B-Mode, PW Mode, and CF Doppler Modes are active.

4-3-9 Color Flow Mode Checks

NOTE: Color Flow Mode only support by LOGIQ C5 Premium

4-3-9-1 Preparations

- 1.) Connect one of the probes listed in 3-6-6 "Available Probes" on page 3-19, in Chapter 3 Installation to the System probe connector.
- 2.) Turn ON the scanner (if isn't turned on already).



Figure 4-16 Controls available in Color Flow Mode

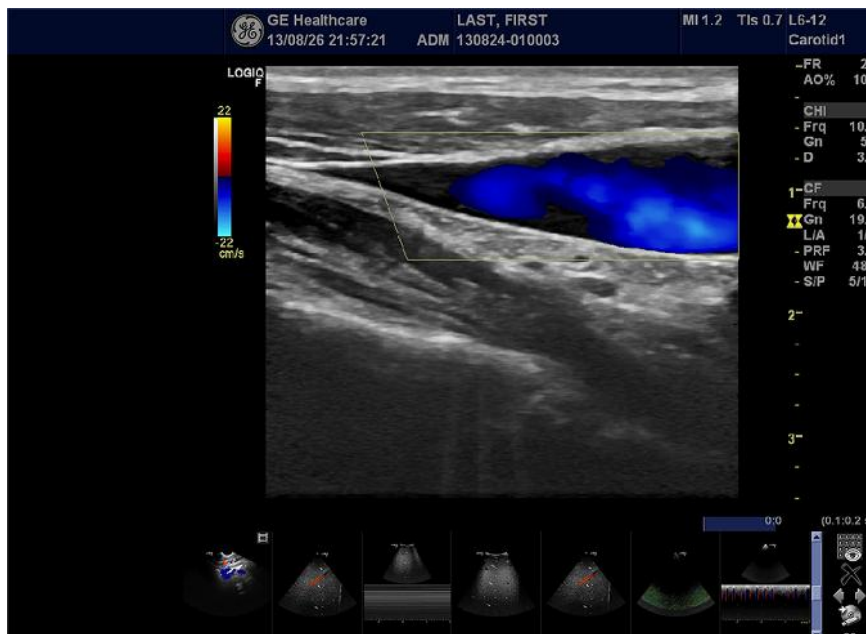


Figure 4-17 CFM Mode Screen Picture Example

4-3-9-2 Color Flow Mode Controls

Table 4-5 Color Flow Mode Controls

Control	Possible Bioeffect	Description/Benefit
Flow Selection	No	In the Lower Extremity Vein (LEV) and Abdominal applications, you can quickly select the flow state via a shortcut on the Color Flow Mode menu.
Gain	No	Gain amplifies the overall strength of echoes processed in the Color Flow window or spectral Doppler timeline.
Scale (Velocity Scale)	Yes	Increases/decreases the Scale on the color bar.
Wall Filter	No	Filters out low flow velocity signals. It helps get rid of motion artifacts caused from breathing and other patient motion.
Size/Position	Yes	Adjust size and position of the color window.
Invert (Color Invert)	No	Lets you view blood flow from a different perspective, e.g., red away (negative velocities) and blue toward (positive velocities). You can invert a real-time or frozen image. <i>NOTE: Invert reverses the color map, NOT the color PRF.</i>
Baseline	No	Changes the Color Flow or Doppler spectrum baseline to accommodate higher velocity blood flow. Minimizes aliasing by displaying a greater range of forward flow with respect to reverse flow, or vice versa. Baseline adjusts the alias point. The default baseline is at the midpoint of the color display and at the midpoint of the color bar reference display.
Angle Steer	Yes	You can slant the ROI of the Color Flow linear image left or right to get more information without moving the probe. The Angle Steer function only applies to linear probes.
Accumulation	No	Accumulation enhances the flow in an image. Available in Color Flow, PDI, and B Flow.
Color Flow Line Density	Yes	Optimizes the Color Flow frame rate or spatial resolution for the best possible color image.
Map	No	Allows you to select a specific color map. After you have made your selection, the color bar displays the resultant map.
Map Compress	No	Change the gradation of color map.
Threshold	No	Threshold assigns the gray scale level at which color information stops.
Frame Average	No	Averages color frames.
Transparency Map	No	Brings out the tissue behind the color map.
Spatial Filter	No	Smooths out the color, makes it look less pixely.
Flash Suppression	No	Activates/deactivates Flash Suppression, a motion artifact elimination process.
Packet Size	Yes	Controls the number of samples gathered for a single color flow vector.
Sample Volume	Yes	Adjusts the size of the color flow doppler transmit wave (or pulse) and size (or length). Lower setting gives better flow resolution and a higher setting increases sensitivity.

Table 4-5 Color Flow Mode Controls

Control	Possible Bioeffect	Description/Benefit
CF/PDI Auto Sample Volume	Yes	Set the default value at Utility -> Imaging -> CF Mode.
CF/PDI Focus Depth	Yes	
CF/PDI Frequency	Yes	
CF/PDI Auto Frequency	Yes	
CF/PDI Center Depth	Yes	
PDI	Yes	Power Doppler Imaging (PDI) is a color flow mapping technique used to map the strength of the Doppler signal coming from the tissue rather than the frequency shift of the signal. Using this technique, the ultrasound system plots color flow based on the number of reflectors that are moving, regardless of their velocity. PDI does not map velocity, therefore it is not subject to aliasing.
TVI (Option)	Yes	Tissue Velocity Imaging (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 gray scale imaging during one or several cardiac cycles with high temporal resolution.
TVD	Yes	TVD: Tissue Velocity Doppler: basing on TVI mode, activate a sample volume of PW ventricular wall to get the spectral information of the sample section.

4-3-10 Basic Measurements

NOTE: The following instructions assume that you first scan the patient and then press **Freeze**.

4-3-10-1 Distance and Tissue Depth Measurements

- 1.) Press **Measure** once, an active caliper displays.
- 2.) To position the active caliper at the start point (distance) or the most anterior point (tissue depth), move the **Trackball**.
- 3.) To fix the start point, press **Set**. The system fixes the first caliper and displays a second active caliper.
- 4.) To position the second active caliper at the end point (distance) or the most posterior point (tissue depth), move the **Trackball**.
- 5.) To complete the measurement, press **Set**. The system displays the distance or tissue depth value in the measurement results window.

Before you complete a measurement:

To toggle between active calipers, press **Cursor Select**.

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, adjust **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, select **Clear**.

4-3-10-2 Circumference/Area (Ellipse) Measurement

- 1.) Press **MEASURE** once; an active caliper displays.
- 2.) To position the active caliper, move the **TRACKBALL**.
- 3.) To fix the start point, press **SET**. The system fixes the first caliper and displays a second active caliper.
- 4.) To position the second caliper, move the **TRACKBALL**.
- 5.) Adjust the **ELLIPSE**; an ellipse with an initial circle shape appears.

NOTE: Be careful not to press the *Ellipse* control as this activates the *Body Pattern*.

- 6.) To position the ellipse and to size the measured axes (move the calipers), move the **TRACKBALL**.
- 7.) To increase the size, adjust the **ELLIPSE** upward button. To decrease the size, adjust the **ELLIPSE** downward button.
- 8.) To toggle between active calipers, press **MEASURE**.
- 9.) To complete the measurement, press **SET**. The system displays the circumference and area in the measurement results window.

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** a second time.

4-3-10-3 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.

4-3-10-4 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.

4-3-11 Probe/Connectors Usage

4-3-11-1 Connecting 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.) Align the connector with the probe port and carefully push into place.
- 5.) Lock the probe.
- 6.) Carefully position the probe cord so it is free to move and is not resting on the floor.

4-3-11-2 Activating the probe

The probe activates in the currently-selected operating mode. The probe's default settings for the mode and selected exam are used automatically.

4-3-11-3 Deactivating the probe

- 1.) Press the **Freeze** key.
- 2.) Gently wipe the excess gel from the face of the probe. (Refer to the Basic User Manual for complete probe cleaning instructions.)
- 3.) Carefully slide the probe around the right side of the keyboard, toward the probe holder. Ensure that the probe is placed gently in the probe holder.

4-3-11-4 Disconnecting the probe

Probes can be disconnected at any time. However, the probe should not be selected as the active probe.

- 1.) Unlock the probe.
- 2.) Pull the probe and connector straight out of the probe port.
- 3.) Carefully slide the probe and connector away from the probe port and around the right side of the keyboard.
- 4.) Ensure the cable is free.
- 5.) Be sure that the probe head is clean before placing the probe in its storage box.



WARNING *Take the following precautions with the probe cables: Do not bend, be sure to keep probe cables free from the wheels.*

4-3-12 Using Cine

4-3-12-1 Activating CINE

Press **Freeze**, then roll the **Trackball** to activate CINE. To start CINE Loop playback, press Run/Stop. To stop CINE Loop playback, press Run/Stop.

4-3-12-2 Quickly Move to Start/End Frame

Press **First** to move to the first CINE frame; press **Last** to move to the last CINE frame.

4-3-12-3 Start Frame/End Frame

Press the **Start Frame** Two-Button Softkey to move to the beginning of the CINE Loop. Adjust the **Start Frame** up/down Two-Button Softkey upward to move forward through the CINE Loop. Adjust the Softkey downward to move backward through the CINE Loop.

Press the **End Frame** Two-Button Softkey to move to the end of the CINE Loop. Adjust the **End Frame** up/down Two-Button Softkey upward to move forward through the CINE Loop. Adjust the Softkey downward to move backward through the CINE Loop.

4-3-12-4 Adjusting the CINE Loop Playback Speed

Adjust the **Loop Speed** up/down Two-Button Softkey to increase/decrease the CINE Loop playback speed.

4-3-12-5 Moving through a CINE Loop Frame By Frame

Adjust the **Frame by Frame** up/down Two-Button Softkey to move through CINE memory one frame at a time.

4-3-13 Backup and Restore Database, Preset Configurations and Images

4-3-13-1 Formatting Media

- 1.) To format the backup media, enter **Utility-> Connectivity->Removable Media**.
- 2.) Select the media type from the drop down menu.
- 3.) Enter the label for the media as shown in Figure 4-18. It is best to use all capital letters with no spaces or punctuation marks. Select **Format**.



Figure 4-18 Format and Verify Media

- 4.) The system displays a pop-up menu, as shown in Figure 4-18 on page 4-26, select **OK** to continue.



Figure 4-19 Format Warning Pop-up Window

- 5.) If desired, verify that the format was successful by returning to **Utility-> Connectivity->Removable Media** and selecting **Verify** as shown in Figure 4-18.

4-3-13-2 Backup System Presets and Configurations

NOTE: Always backup any preset configurations before a software reload. This ensures that if the presets need to be reloaded, after the software update, they will be the same ones the customer was using prior to service.

- 1.) Insert a formatted media into the drive.
- 2.) Enter enter **Utility-> System-> Backup/Restore**.

NOTE: If you are not logged in as GE Service or with administrator privileges, the Operator Login window is displayed. Log on with administrator privileges.

- 3.) In the Backup list, select **Patient Archive**, **Report Archive**, **User Defined Configuration** and **Service**.
- 4.) In the Media field, select CD/DVD (or USB memory device).
- 5.) Select **Backup**, as shown in Figure 4-20.

The system performs the backup. As it proceeds, status information is displayed on the Backup/Restore screen.

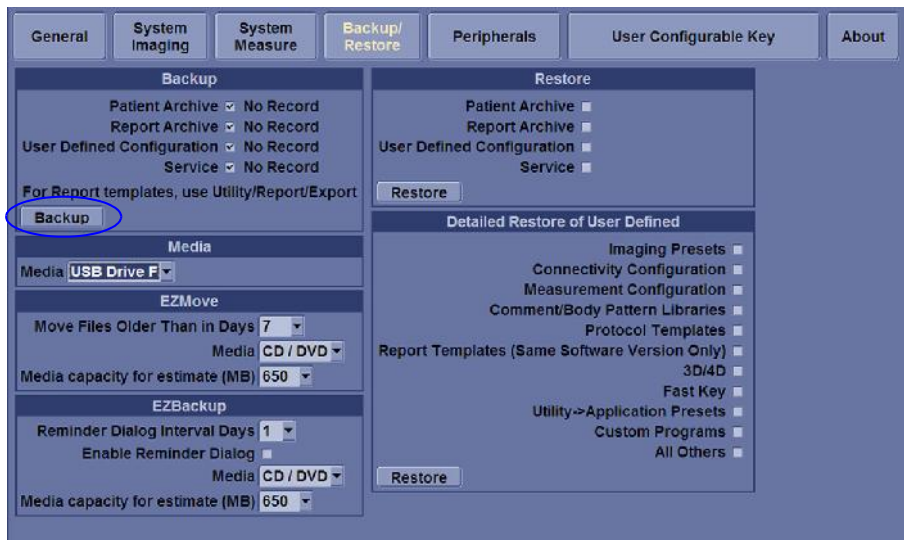



Figure 4-20 Backup/Restore Menu

4-3-13-3 Restore System Presets and Configurations

 **CAUTION** The restore procedure **overwrites** the existing database on the local hard drive. Make sure to insert the correct CD (or USB memory device).

- 1.) Insert the Backup/Restore CD/DVD (or USB memory device) into the drive.
- 2.) Enter enter **Utility-> System-> Backup/Restore**.

NOTE: *If you are not logged in with administrator privileges, the Operator Login window is displayed. Log on with administrator privileges.*

- 3.) In the Restore list, select **Patient Archive, Report Archive, User Defined Configuration and Service**.
- 4.) In the Media field, select the Backup/Restore CD/DVD (or USB memory device).
- 5.) Select **Restore**.

The system performs the restore. As it proceeds, status information is displayed on the Backup/Restore screen.

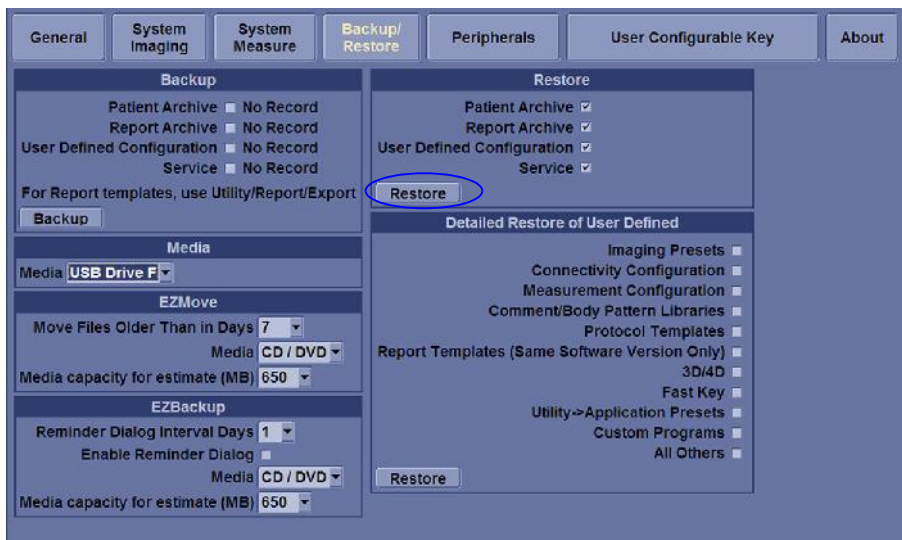


Figure 4-21 Backup/Restore Menu

4-3-13-4 Archiving Images

- 1.) Insert the archive media.
- 2.) To format the archive media, enter **Utility-> Connectivity-> Removable Media**.
- 3.) Format the CD. Verify the format if desired.
- 4.) Images will be moved from the hard drive by date. Therefore, the best way is to label media by date.

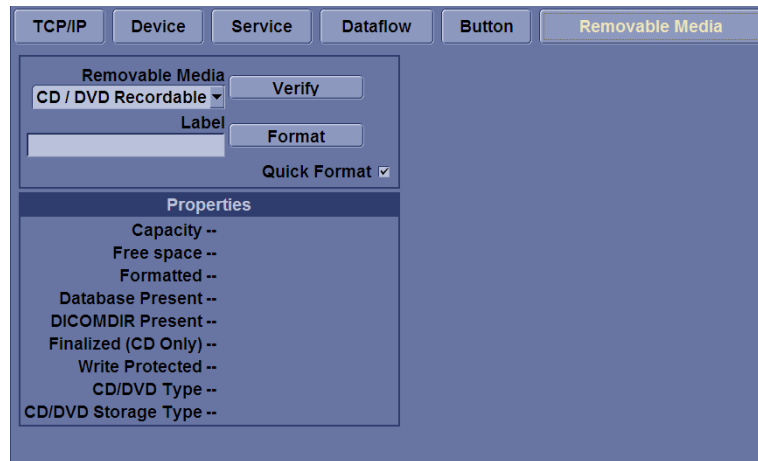


Figure 4-22 Format Media Screen

- 5.) Enter **Utility-> System-> Backup/Restore**, select “Move files older Than in Days”.

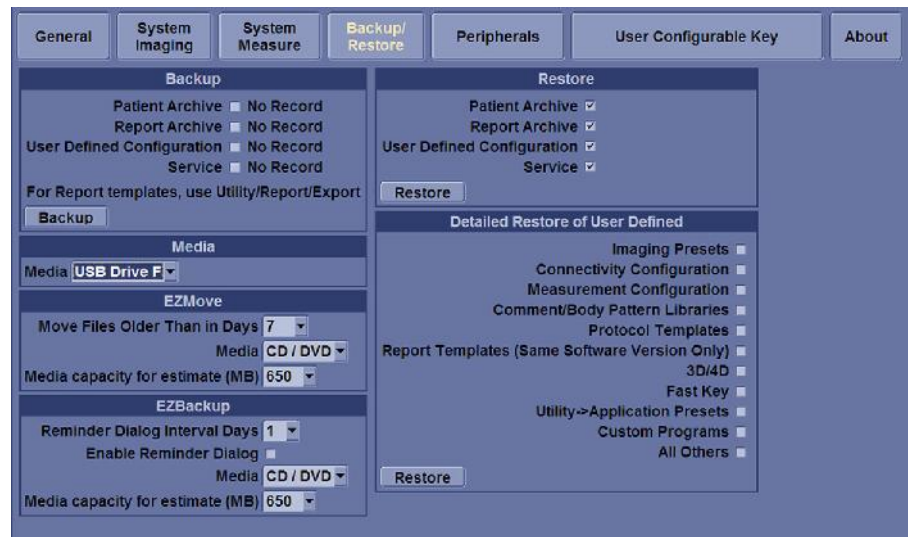


Figure 4-23 EZBackup/Move

4-3-13-4 Archiving Images (cont'd)

- 6.) Go to **Archive** menu and select **EZBackup/EZMove**, the EZBackup/EZMove wizard starts.

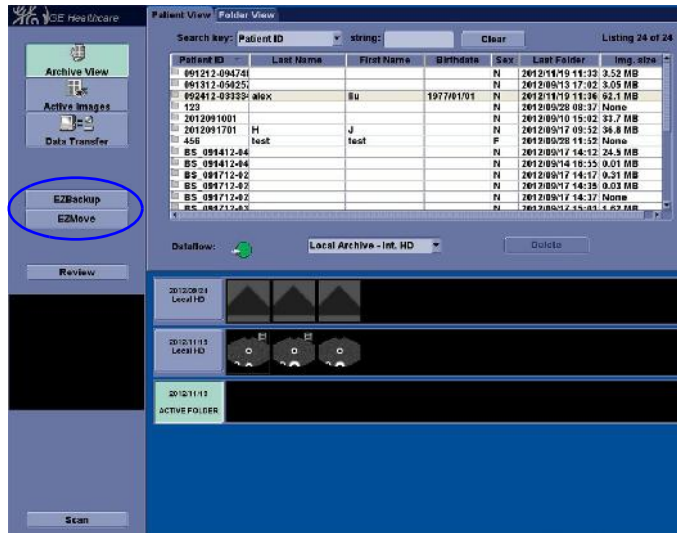


Figure 4-24 Archive Screen

- 7.) Verify the information on the first page of EZBack/EZMove wizard, then select **Next**.

If you want to backup all of the exams in the range (even if the exam was previously backed up), check this option. If you uncheck this option, the system only backs up exams which have not yet been backed up.

NOTE: You can set the date range in Utility --> System --> Backup/Restore --> Move files older than in days for EZMove.



Figure 4-25 EZBackup Wizard 1

4-3-13-4 Archiving Images (cont'd)

8.) It indicates the size of the data and the storage. Select **Next** to continue.

NOTE: The calculation for the number of backup CD is only an estimate. Allow for one additional CD when performing an EZBack/EZMove.



Figure 4-26 EZBackup Wizard 2

NOTE: This message "Please insert a blank media..." appears if you press Next without inserting the backup media. Insert the media and continue.

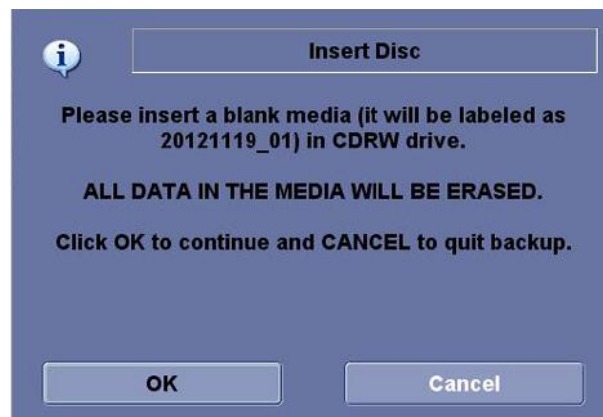


Figure 4-27 Insert Media Message

4-3-13-4 Archiving Images (cont'd)

9.) The status menu appears. When the backup/move has been complete, press **Next**.



Figure 4-28 EZBackup Wizard 3

NOTE: If you need to insert the next media, a message appears providing you with the media label. Label the media, then insert the next media and press OK.

10.)When the backup is complete, the completion wizard page appears. Press **Finish**.



Figure 4-29 EZBackup Completion Window

All databases, presets and images should now be saved to removable media.

Section 4-4 Software Configuration Checks

Table 4-6 Software Configuration Checks

Step	Task to do	Expected Result(s)
1.	Check Date and Time setting	Date and Time are correct
2.	Check that Location (Hospital Name) is correct	Location Name is correct
3.	Check Language settings	Desired Language is displayed
4.	Check assignment of Printer Keys	The default function for Store and Print Keys are Store (store image), Print (print). Store and Print Keys can also be assigned as desired by the customer
5.	Check that all of the customer's options are set up correct	All authorized functions are enabled

Section 4-5 Peripheral Checks

Check that peripherals work as described below:

Table 4-7 Peripheral Checks

Step	Task to do	Expected Result(s)
1.	Press (FREEZE)	Stop image acquisition.
2.	Press (PRINT) on the Control Panel	The image displayed on the screen is printed on B&W printer.
3.	Connect with Foot Switch on USB port and press once.	To start image acquisition (the same function as (FREEZE) key).

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Chapter 5

Components and Functions (Theory)

Section 5-1 Overview

5-1-1 Purpose of Chapter 5

This chapter explains LOGIQ F SERIES' system concepts, component arrangement, and subsystem function.

Table 5-1 Contents in Chapter 5

Section	Description	Page Number
5-1	Overview	5-1
5-2	Block Diagram	5-2
5-3	Common Service Platform	5-4

Section 5-2 Block Diagram

5-2-1 System Diagram

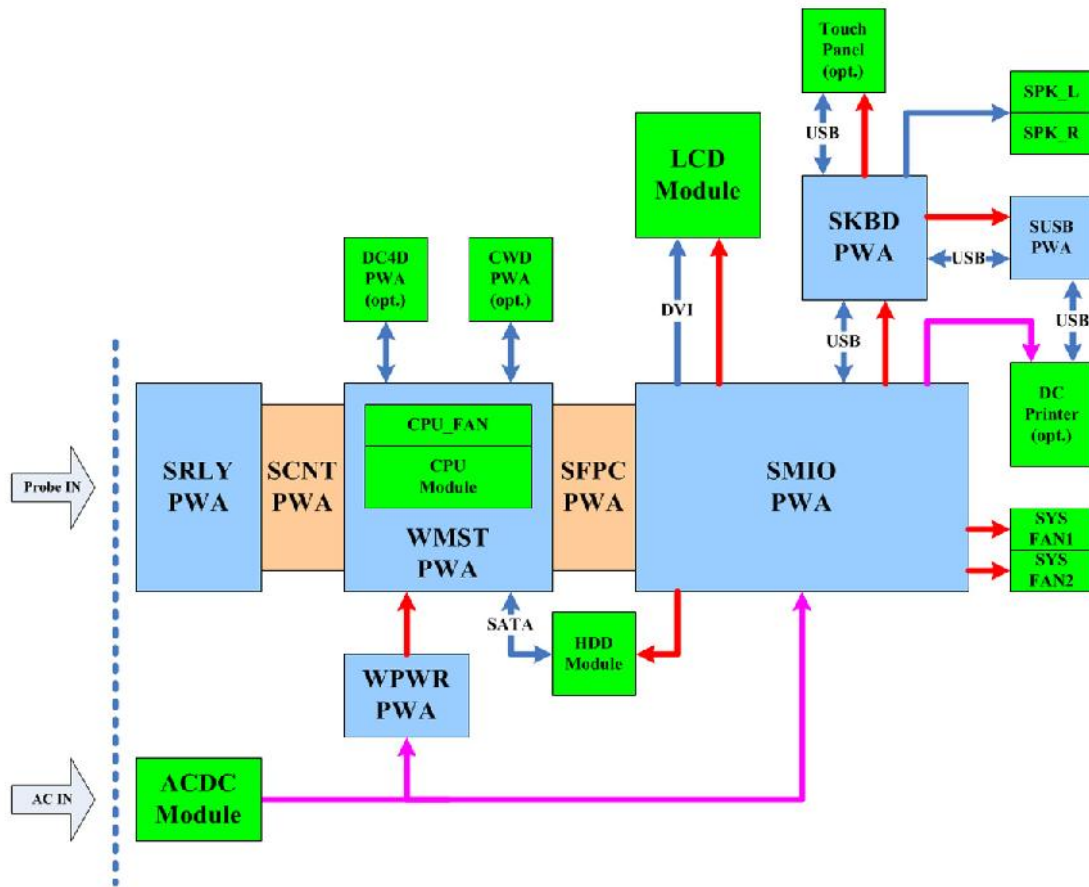


Figure 5-30 LOGIQ F Series System Diagram

5-2-2 Software Diagram

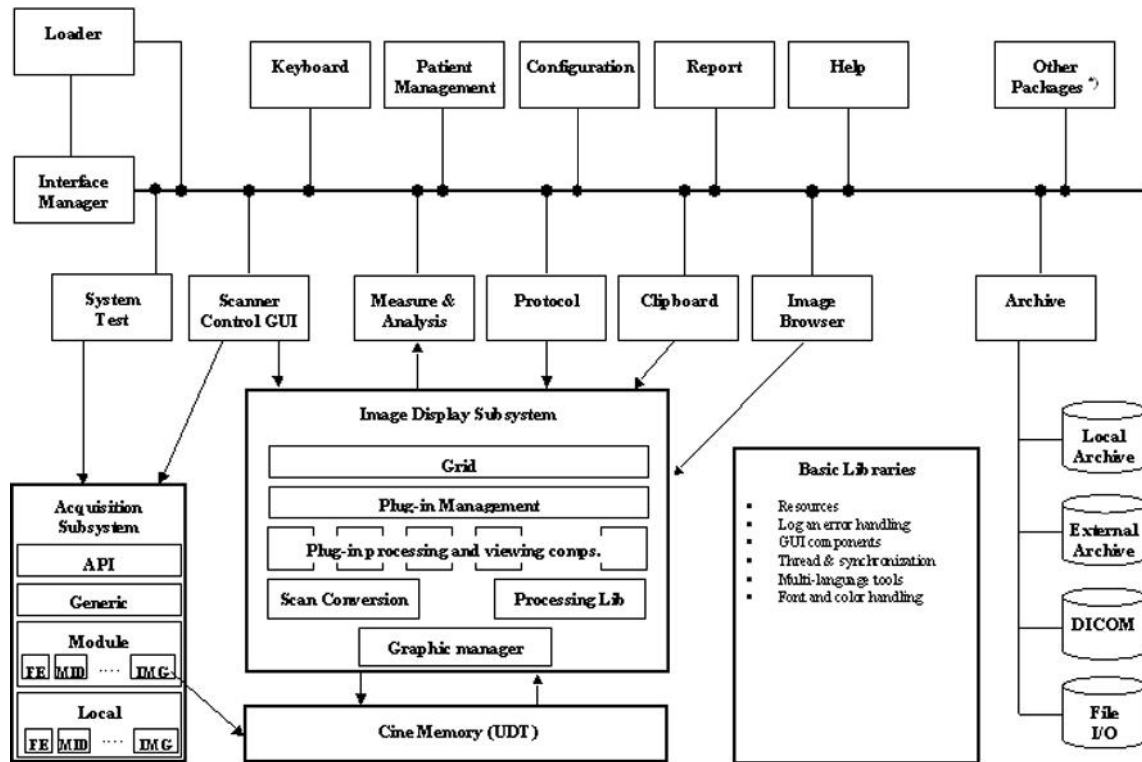


Figure 5-31 LOGIQ F Series Software Diagram

Section 5-3 Common Service Platform

5-3-1 Introduction

The Service Platform contains a set of software modules that are common to all PC backend ultrasound and cardiology systems. The Common Service Platform will increase service productivity and reduce training and service costs.

Chapter 6

Service Adjustments

Section 6-1 Overview

6-1-1 Purpose of this chapter 6

This section describes how to test and adjust the scanner. These tests are optional. You may use them to check the system for errors.

Table 6-2 Contents in chapter

Section	Description	Page Number
6-1	Overview	6-1
6-2	Monitor Adjustments	6-2

Section 6-2 Monitor Adjustments

6-2-1 Adjustments Procedures

To adjust the brightness:

For LOGIQ C3/LC5 Premium: Adjust the LCD monitor's button, located the right side of the LCD Monitor.

For LOGIQ C3/LC5 Premium: Adjust the LCD monitor's button, located the bottom of the LCD Monitor.

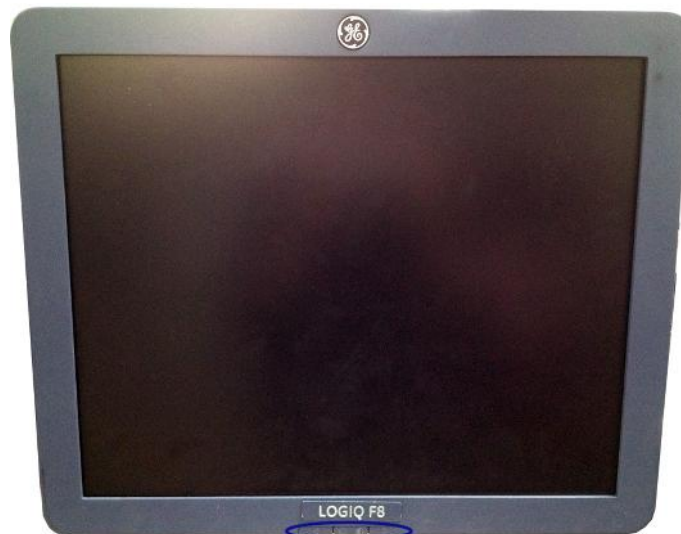


Figure 6-32 LCD Monitor

To adjust the light:

NOTE: If the left side button of the LCD has the light symbol, the LCD has the lights to light the keyboard.

For LOGIQ C3/C5 Premium: Adjust the left side button of the monitor to turn on/off the light.



Figure 6-33 Light Adjustment

Chapter 7

Diagnostics/Troubleshooting

Section 7-1 Overview

7-1-1 Purpose of Chapter 7

This section describes how to setup and run the tools and software that help maintain image quality and system operation. Very basic host, system and board level diagnostics are run whenever power is applied. Some Service Tools may be run at the application level. However most software tests are required.

Table 7-3 Contents in Chapter 7

Section	Description	Page Number
7-1	Overview	7-1
7-2	Gathering Trouble Data	7-2
7-3	Screen Captures	7-4
7-4	Common Diagnostics	7-7
7-5	Network Configuration	7-9

Section 7-2 Gathering Trouble Data

7-2-1 Overview

There may be a time when it would be advantageous to capture trouble images and system data (logs) for acquisition to be sent back to the manufacturer for analysis. There are different options to acquire this data that would give different results.

7-2-2 Collect Vital System Information

The following information is necessary in order to properly analyze data or images being reported as a malfunction or being returned to the manufacturer:

- Product Name = LOGIQ F Series

From the *Utility>System>General>About* screen:

Applications Software

- Software Version
- Software Part Number

System Image Software

- Image Revision
- Image Part Number

7-2-3 Collect a Trouble Image with Logs

If the system should malfunction, press the Alt-D keys simultaneously. This will collect a screen capture of the image monitor, system presets and the following logs:

- Keyboard Shadow Log
- Error Logs
- Crash Log
- Power Supply
- Temperature

NOTE: *Power Supply and Temperature logs are not currently being updated by the LOGIQ F Series.*

This Alt-D function is available at all times.



Figure 7-1 ALT-D Dialog Box

When Alt-D is pressed, a menu box appears that allows for:

- A place to enter a description of the problem
- A choice to store to a pre-formatted CD-R, RD (Removable Disk) or to the *Export* directory D: drive.

The subsequent file is compressed and time stamped. The screen capture is a bitmap which eliminates the possibility of artifacts from compression.

Section 7-3 Screen Captures

There may be times when the customer or field engineer will want to capture a presentation on the screen. This is accomplished by first saving the image(s) to the clipboard using a Print Key.

7-3-1 Check and Record the Store Key Function

Check the function of the Print Key in the event that the customer may have made some custom settings.

- 1.) Enter **Utility -> Connectivity -> Buttons**.
- 2.) In the *Physical Print Buttons* field, select Print1, Print2 or Print3.

The Connectivity/Buttons Screen will be displayed like the one shown in [Figure 7-2 on page 7-4](#).

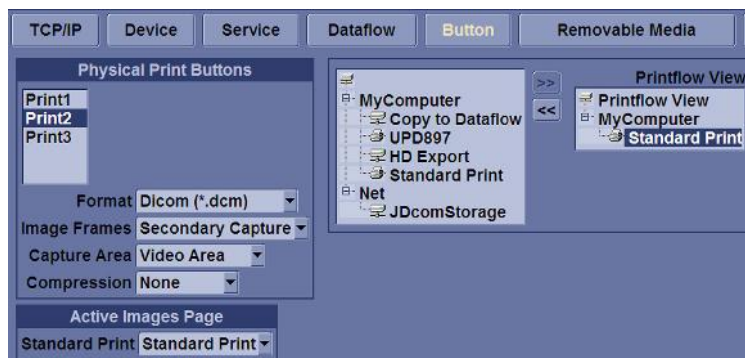


Figure 7-2 Set print Key

If Print key is not set to Whole Screen, as shown in [Figure 7-2](#), proceed to step 5 to record the customer's customized settings.

- 3.) In the Destinations section, record the service that is displayed.
- 4.) In the *Physical Print Buttons* section, record the parameters related to the service.

7-3-2 Setting the Print Key to Screen Capture

If the Print Key is not set to screen capture:

- 1.) While on the Connect screen, with the Buttons tab displayed, go to the *Destinations* list.
- 2.) From the list select *Copy To Dataflow*. Press [>>] to add the selection to the *Printflow View* section.
- 3.) Ensure that the *Physical Print Buttons* section for capture Area is set to Whole Screen, secondary Capture and No Image Compression.
- 4.) The Store Key should now be set up for whole screen capture, sending the screens to the image buffer (clipboard).

7-3-3 Capturing a Screen

The following is a generic process to capture any screen from the scanner:

- 1.) Navigate to and display the image/screen to be captured.
- 2.) Press **Print**. This will place a snapshot of the screen on the "clipboard" displayed at the bottom of the scan image display.

7-3-3 Capturing a Screen (cont'd)



Figure 7-3 Select Image to Capture

- 3.) Click FREEZE to unfreeze the image to view the image screen and the snapshots displayed on the bottom.
- 4.) Highlight the snapshot to be stored to RD (Removable Disk) or CD-R.
- 5.) Select Menu on the right side of the image screen, then highlight and select SAVE AS.

7-3-3 Capturing a Screen (cont'd)

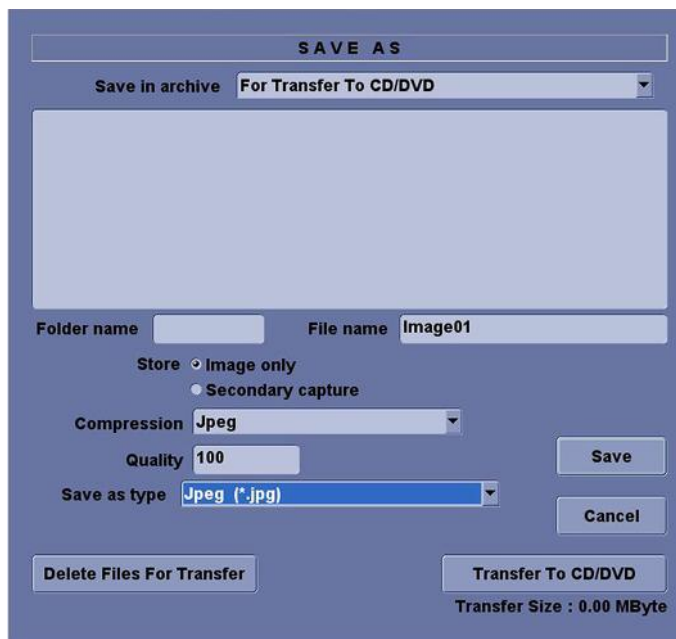


Figure 7-4 Save Dialog Box

- 6.) A Save dialog box will be opened. Choose *d:\export folder* as the archive location to save the image on the hard disk or CD-R.



NOTICE After capture the snapshot of the screen to the “clipboard” and save it to the hard disk or other media, it is not full screen image on the hard disk or media.

7-3-4 Reset the Store Key to Customer’s Functionality

If the customer had programmed the Store Key to a function other than screen capture, restore that functionality recorded in [Setting the Print Key to Screen Capture on page 7 - 4](#). Refer to [Figure 7-2](#).

- 1.) Click *Utility* on the keyboard.
- 2.) Select *Connectivity* from the Utilities Menu.
- 3.) Select the *Buttons* tab on the Connectivity screen.
- 4.) In the *Physical Print Button* field, select *Store*.
- 5.) In the *Destinations* list, select the service(s) recorded in step 5, Section [7-3-2](#).
- 6.) In the *Physical Print Buttons* section, select the parameters related to the service recorded in step 6, Section [7-3-2](#).

Section 7-4 Common Diagnostics

7-4-1 Utilities

Provides two selections:

7-4-1-1 Disruptive Mode

Allows you to enable or disable disruptive mode troubleshooting.

7-4-1-2 System Shutdown

Allows for system shutdown from the diagnostic menu. Select to *Restart System* or *Shutdown System*. Also, select to retain Disruptive Mode or Not.

After submitting to restart or shutdown a confirmation screen gives one last chance to confirm or cancel the request.

7-4-2 PC Diagnostics (Non-Interactive Tests)

- 7-4-2-1 Essential Tests**
- 7-4-2-2 Hard Drive Long**
- 7-4-2-3 Hard Drive Short**
- 7-4-2-4 Memory**
- 7-4-2-5 Network Adapter**
- 7-4-2-6 System Board**
- 7-4-2-7 Video**

7-4-3 PC Diagnostics (Interactive Tests)

- 7-4-3-1 AVI Playback**
- 7-4-3-2 Keyboard**
- 7-4-3-3 Microphone**
- 7-4-3-4 Monitor**
- 7-4-3-5 Sound**
- 7-4-3-6 USB Ports**

7-4-4 Restart LOGIQ F Series After Diagnostics

Always shutdown the system and reboot after a diagnostics session.

Section 7-5 Network Configuration

7-5-1 Network Configuration

- 1.) Connect system with network.
- 2.) Enter **Utility-> Connectivity-> TCP/IP**, in IP settings window, check **Enable DHCP**, and select the proper network speed in **Network Speed**.

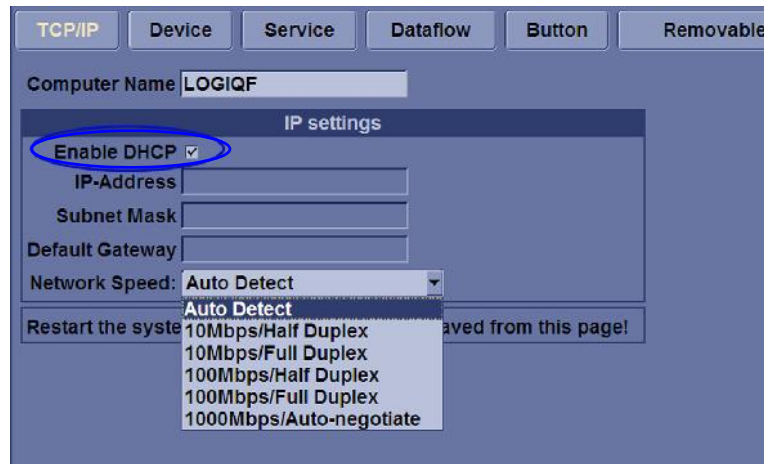


Figure 7-5 Enable DHCP

NOTE: If user wants to setup static IP address, uncheck **Enable DHCP** option, input static address in **IP-Address box**, **Subnet Mask** and **Default Gateway** box. In **Network Speed**, choose the proper speed available.

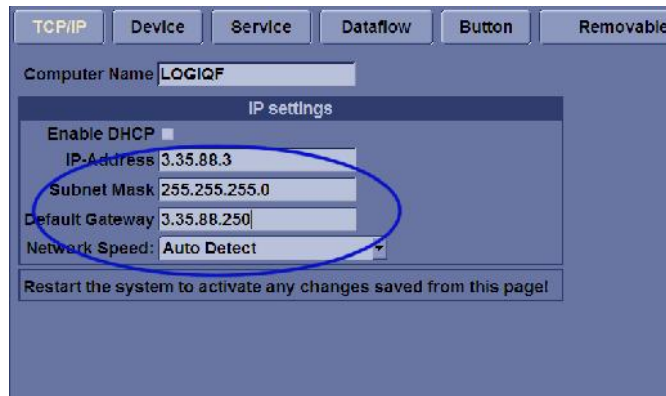


Figure 7-6 Input static address

- 1.) **Connect system with network.** (cont'd)
 - 3.) Select **Save**, and a popup window displays. Select **OK** to restart the system and activate the changes.

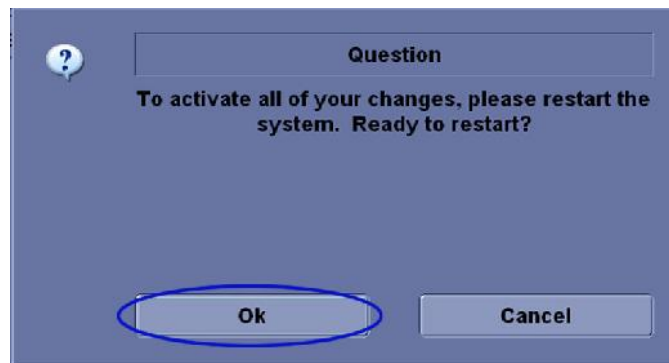


Figure 7-7 System Restart inquiry dialog

- 4.) After the system restarts, the network icon at the left bottom of screen displays as connected.



Figure 7-8 Network icon

Chapter 8

Replacement Procedures

Section 8-1 Overview

8-1-1 Purpose of Chapter 8




This chapter describes replacement procedures for the following modules and subsystems.

Table 8-1 Contents in Chapter 8

Section	Description	Page Number
8-1	Overview	8-1
8-2	DISASSEMBLY/RE-ASSEMBLY	8-2
8-2-1	Warning and Caution	8-2
8-2-2	Returning/Shipping for repairs	8-2
8-2-3	Air filter	8-3
8-4	Loading Base Image Software	8-5

Section 8-2 DISASSEMBLY/RE-ASSEMBLY

8-2-1 Warning and Caution

-  **WARNING** ***ONLY QUALIFIED SERVICE PERSONNEL SHOULD REMOVE ANY COVERS OR PANELS. ELECTRICAL HAZARDS EXISTS AT SEVERAL POINTS INSIDE. BECOME THOROUGHLY FAMILIAR WITH ALL HAZARDOUS VOLTAGES AND HIGH CURRENT LEVELS TO AVOID ACCIDENTAL CONTACT***
-  **CAUTION** Do not wear the ESD wrist strap when you remove a part of power supply unit. Turn OFF power and unplug the power cord before removing a part of power supply unit. However be sure to turn off power and wear the strap before you remove a circuit boards.
-  **WARNING** ***DO NOT SERVICE OR DISASSEMBLE PARTS UNDER FRU UNIT LEVEL AT ANY CIRCUMSTANCES.***

8-2-2 Returning/Shipping for repairs

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 an 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 that 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 purposes and must be transported as a hazardous material.*

If the LOGIQ F Series needs to be sent for repair, ensure that any patient information is erased from the Harddisk/Storage Device. In case that any patient information is still residing on the LOGIQ F Series, GE will contact the customer and request for urgent collection of that patient information. GE will keep this patient information in a secure environment for a maximum period of 1 month. All patient information will be permanently deleted at that point.

If PHI (Patient Healthcare Information) data needs to be sent to GE employees for service purposes, GE will ascertain agreement from the customer. The patient information shall only be transferred by approved service processes, tools and devices restricting access, protecting or encrypting data where required, and providing traceability in the form of paper or electronic documents at each stage of the procedure while maintaining compliance with cross-border restrictions of patient information transfers.

8-2-3 Air filter

8-2-3-1 Tools

- Common phillips screwdrivers

8-2-3-2 Preparations

- Shut Down the System and disconnect the power cord.

8-2-3-3 Removal Procedure

- 1.) Pull out the air filter from the rear panel.
- 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.) Pull back the air filter.

8-2-3-4 Mounting procedure

Install the new parts in the reverse order of removal.



Figure 8-9 Air filter Disassembly

Section 8-3 Trackball Roller Cleaning

Purpose: This is description on how to remove the trackball and clean the roller.

8-3-0-1 Tools

- No need.

8-3-0-2 Needed Manpower

- 1 person, 3 minutes + travel

8-3-0-3 Preparations

- Shut down the system.

8-3-0-4 Procedure

- 1.) Rotate the retainer counterclockwise until it can be removed from the keyboard, refer to [Figure 8-10 on page 8-4](#) .
- 2.) Separate the trackball and the retainer. Wipe off any oil or dust from the trackball, retainer and the trackball housing using a cleaner or cotton swab.
- 3.) Assemble the trackball and retainer, then put in into the housing and rotate it clockwise until its notches are set in the position.

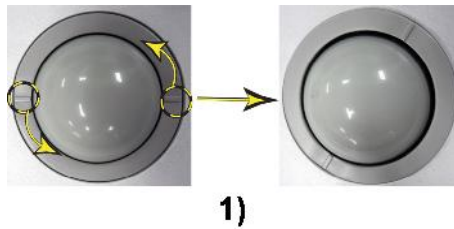


Figure 8-10 Trackball Disassembly

Section 8-4 Loading Base Image Software

NOTE: While it is believed to be unnecessary, It would not hurt to disconnect the system from the network and remove all transducers.

NOTE: Please ensure power cable is connected during system upgrade!

- 1.) Insert the USB disk labeled "System & Application Software" in the USB port of the system.
- 2.) Properly turn off the scanner by momentarily pressing the *Power On/Off* Switch. Select "Shut Down" from the System Exit menu.
- 3.) If the system will not shutdown normally, hold down the *Power On/Off* Switch until the light turns from green to amber.
- 4.) Turn on the system. System will detect the USB automatically.
- 5.) Press any key to continue when below message display as shown below.

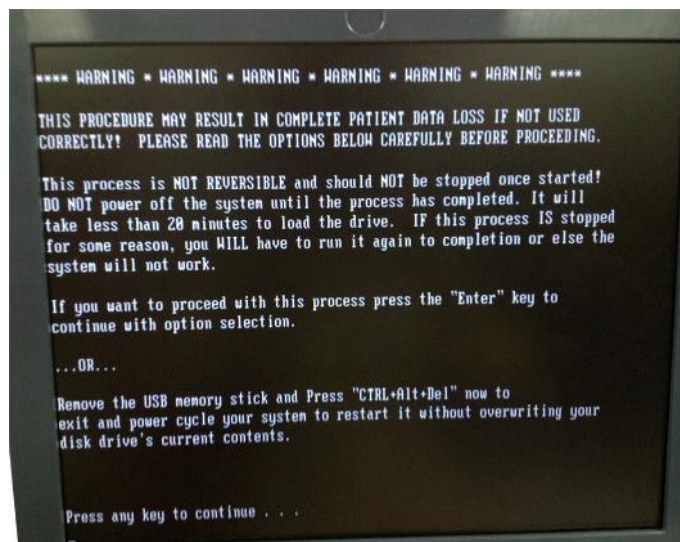


Figure 8-11 Upgrade message

Section 8-4 Loading Base Image Software (cont'd)

6.) Select one of the options for loading the system. Select choice 1] to load the complete disk.

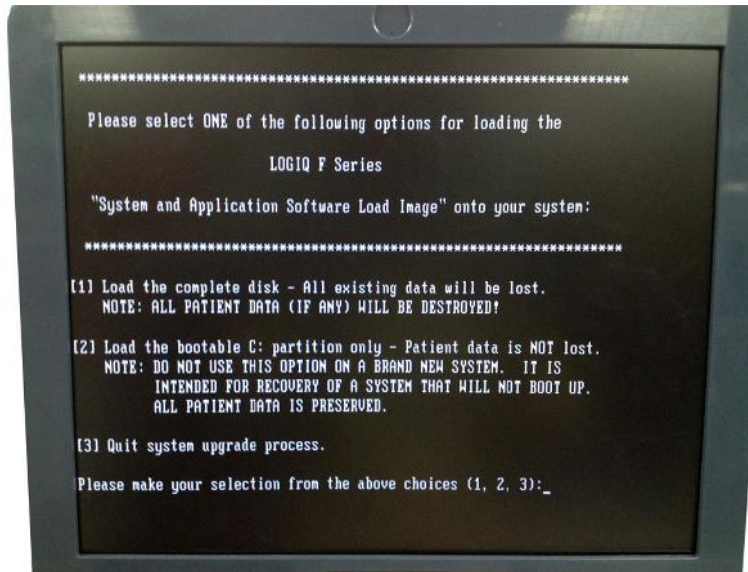


Figure 8-12 Selection for loading the system

⚠ WARNING *While the software install procedure is designed to preserve data, you should select choice [2] to format disk C only.*

7.) Press any key to continue when below message display as shown below.

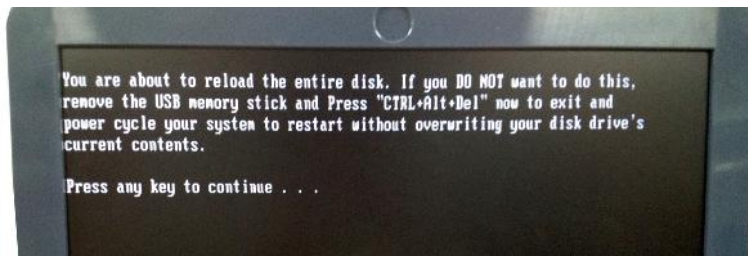


Figure 8-13 Upgrade continue message

Section 8-4 Loading Base Image Software (cont'd)

8.) System will be loaded as shown in the screen below.

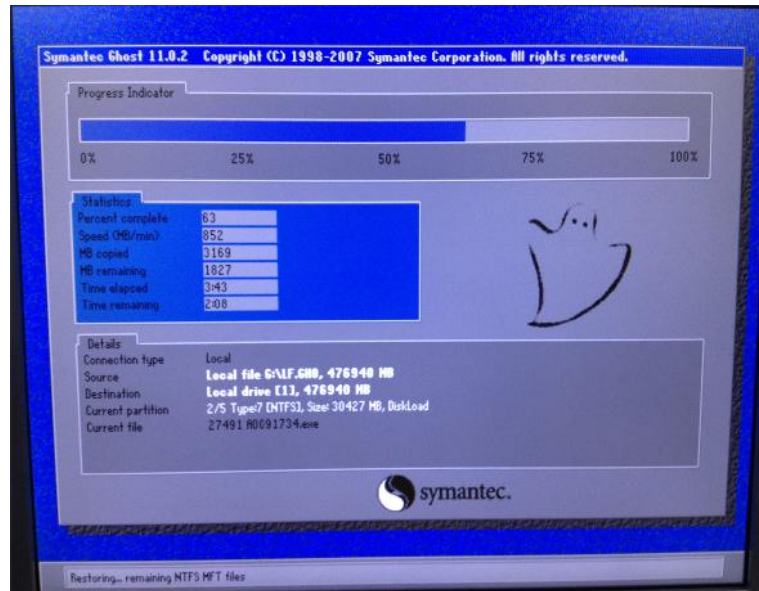


Figure 8-14 System Load

9.) System updating finished, refer to [Figure 8-15 on page 8-7](#) .

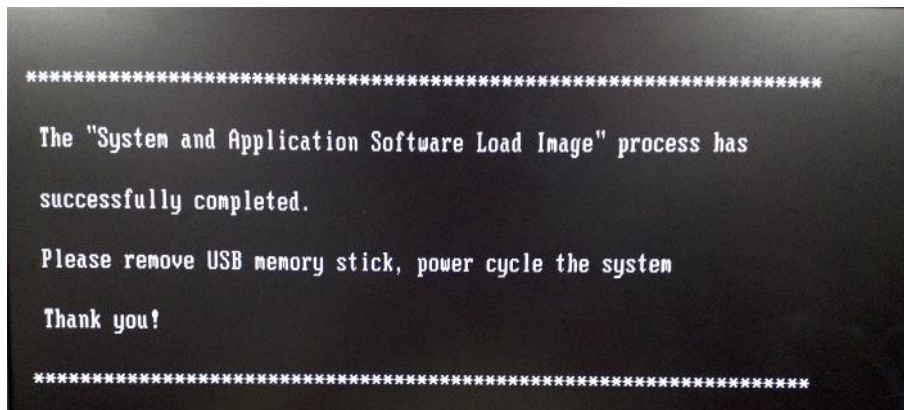


Figure 8-15 System upgrade complete

10.) Remove the USB stick, then press power key to restart the system.

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Chapter 9

Renewal Parts

Section 9-1 Overview

9-1-1 Purpose of Chapter 9

This chapter gives you an overview of Renewal Parts for LOGIQ F Series.

Table 9-1 Contents in Chapter 9

Section	Description	Page Number
9-1	Overview	9-1
9-2	List of Abbreviations	9-1
9-3	Renewal Parts Lists	9-2
9-4	Operator Console Assy	9-3
9-5	Manuals	9-4
9-6	Probes	9-6

Section 9-2 List of Abbreviations

- Assy - Assembly
- Ctrl - Control
- FRU 1 - Replacement part available in part hub
- FRU 2 - Replacement part available from the manufacturer (lead time involved)
- Int - Internal
- I/O - Input/Output
- LCD - Liquid Crystal Display
- MON - Monitor
- PAT. - Patient
- PC - Personal Computer (Back End Processor)

Section 9-3 Renewal Parts Lists

9-3-1 Equipment Models Covered in this Chapter

Table 9-2 Renewal Parts List for Customer

Part Name	Part Number	Description	Quantity	FRU
AC Power Cord	5177123-2	Power cord Europe Class	1	1
AC Power Cord	5176304-2	Power cord China Class	1	1
AC Power Cord	5176773-2	Power cord India/South Africa Class	1	1
AC Power Cord	5177195-2	Power cord Argentina Class	1	1
AC Power Cord	5176907-2	Power cord UK Class	1	1
AC Power Cord	5177153-2	Power cord Denmark Class	1	1
AC Power Cord	5177154-2	Power cord Switzerland Class	1	1
AC Power Cord	5177187-3	Power cord Australia/New Zealand Class	1	1
AC Power Cord	5177146-2	Power cord USA Class	1	1
AC Power Cord	5176753-2	Power cord Israel Class	1	1
AC Power Cord	5177126-2	Power cord Japan Class	1	1
AC Power Cord	5400868-2	Power cord Brazil Class	1	1

Section 9-4 Operator Console Assy



Figure 9-16 Operator Console Assy

Section 9-5Manuals

Item	Part Number	Description	Qty	FRU
6000	5446617-100	LOGIQ F Series Service Manual	1	N
System User Manuals				
6001	5454368-100	LOGIQ F Series Basic User Manual, English	1	N
6002	5453550-100	LOGIQ F Series User Guide, English	1	N
6003	5453550-101	LOGIQ F Series User Guide, French	1	N
6004	5453550-106	LOGIQ F Series User Guide, Spanish	1	N
6005	5453550-108	LOGIQ F Series User Guide, German	1	N
6006	5453550-111	LOGIQ F Series User Guide, Italian	1	N
6007	5453550-121	LOGIQ F Series User Guide, Dutch	1	N
6008	5453550-127	LOGIQ F Series User Guide, Brazilian Portuguese	1	N
6009	5453550-129	LOGIQ F Series User Guide, Estonian	1	N
6010	5453550-131	LOGIQ F Series User Guide, Slovenian	1	N
6011	5453550-140	LOGIQ F Series User Guide, Japanese	1	N
6012	5453550-142	LOGIQ F Series User Guide, Swedish	1	N
6013	5453550-144	LOGIQ F Series User Guide, Korean	1	N
6014	5453550-145	LOGIQ F Series User Guide, Russian	1	N
6015	5453550-150	LOGIQ F Series User Guide, Polish	1	N
6016	5453550-151	LOGIQ F Series User Guide, Greek	1	N
6017	5453550-153	LOGIQ F Series User Guide, Hungarian	1	N
6018	5453550-154	LOGIQ F Series User Guide, Slovakian	1	N
6019	5453550-155	LOGIQ F Series User Guide, Czech	1	N
6020	5453550-159	LOGIQ F Series User Guide, Turkish	1	N
6021	5453550-160	LOGIQ F Series User Guide, Danish	1	N
6022	5453550-161	LOGIQ F Series User Guide, Norwegian	1	N
6023	5453550-162	LOGIQ F Series User Guide, Finnish	1	N
6024	5453550-165	LOGIQ F Series User Guide, Bulgarian	1	N
6025	5453550-167	LOGIQ F Series User Guide, Romanian	1	N
6026	5453550-168	LOGIQ F Series User Guide, Croatian	1	N
6027	5453550-174	LOGIQ F Series User Guide, Lithuanian	1	N
6028	5453550-175	LOGIQ F Series User Guide, Latvian	1	N
6029	5453550-176	LOGIQ F Series User Guide, Serbian	1	N
6030	5453550-177	LOGIQ F Series User Guide, European Portuguese	1	N
6031	5453550-181	LOGIQ F Series User Guide, Indonesian	1	N
6032	5453550-184	LOGIQ F Series User Guide, Ukrainian	1	N

Item	Part Number	Description	Qty	FRU
6033	5454731-141	LOGIQ F3 User Guide, Chinese	1	N
6034	5457182-141	LOGIQ F5/F6 User Guide, Chinese	1	N
6035	5444538-141	LOGIQ F8 User Guide, Chinese	1	N

Section 9-6 Probes

Table 9-3 Probes on LOGIQ F Series

Item	Part Name	Part Number	Description	Quantity	FRU
7000	4C-RS	5451471	Probe (Center Frequency: 3.10MHz)	1	1
7001	8C-RS	5434194	Probe (Center Frequency: 6.5MHz)	1	1
7002	E8C-RS	5409293	Probe (Center Frequency: 6.5MHz)	1	1
7003	3Sc-RS	47237516	Probe (Center Frequency: 2.75MHz)	1	1
7004	L6-12-RS	5454332	Probe (Center Frequency: 7.75MHz)	1	1
7005	RAB2-6-RS	KT2302893	Probe (Center Frequency: 3.30MHz)	1	1



NOTICE All the spare parts should be disposed according to local laws.

Chapter 10

Care & Maintenance

Section 10-1 Overview

10-1-1 Periodic Maintenance Inspections

It has been determined by engineering that your 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.

10-1-2 Purpose of Chapter 10

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.

Table 10-1 Contents in Chapter 10

Section	Description	Page Number
10-1	Overview	10-1
10-2	Why do Maintenance	10-2
10-3	Maintenance Task Schedule	10-2
10-4	Tools Required	10-4
Section 10-5	When There's Too Much Leakage Current...	10-15



CAUTION Practice good ESD prevention. Wear an anti-static strap when handling electronic parts and even when disconnecting/connecting cables.



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 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 10-2 Why do Maintenance

10-2-1 Keeping Records

It is good business practice that ultrasound facilities maintain records of quality checks and corrective maintenance. The Ultrasound Inspection Certificate (provided on page 10-16) 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.

10-2-2 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 physicist, 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 information and/or price for service.

Section 10-3 Maintenance Task Schedule

10-3-1 How often should care & maintenance tasks be performed?

The Care & Maintenance Task Schedule (provided on page 10-3) specifies how often your LOGIQ C3/C5 Premium should be serviced and outlines items requiring special attention.

NOTE: *It is the customer's responsibility to ensure the LOGIQ C3/C5 Premium 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 C3/C5 Premium 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 C3/C5 Premium 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 maintenance frequencies.*

Section 10-3 Maintenance Task Schedule (cont'd)

Table 10-2 Customer Care Schedule

Service at Indicated Time	Daily	Weekly	Monthly	Per Facilities QA Program	Notes
Clean Probe Holders	•				
Clean Air Filter		•			more frequently depending on your environment
Inspect AC Mains Cable			•		Mobile Unit Check Weekly
Inspect Cables and Connectors			•		
Clean Console			•		
Inspect Wheels, Casters, brakes and Swivel Locks			•		Mobile Unit Check Daily
Check Control Panel Movement			•		Mobile Unit Check Daily
Console Leakage Current Checks				•	also after corrective maintenance
Peripheral Leakage Current Checks				•	also after corrective maintenance
Surface Probe Leakage Current Checks				•	also after corrective maintenance
Endocavity Probe Leakage Current Checks				•	also after corrective maintenance
Transesophageal Probe Leakage Current Checks				•	also after corrective maintenance
Surgical Probe Leakage Current Checks				•	also after corrective maintenance
Measurement Accuracy Checks				•	also after corrective maintenance
Functional Checks				•	also after corrective maintenance

NOTE: PMs are not mandatory, the table above is for reference only.

NOTE: May require specialized equipment to complete.

Section 10-4 Tools Required

10-4-1 Standard GE Tool Kit

The following is a description of the “Standard” GE tool kit in the USA. Not all tools are required for PMs.

Table 10-3 Overview of GE-1 Tool Kit Contents

Tool ID	Description	Tool ID	Description
9-45358	Pliers Retaining Ring	9-XL9971MM	Xcelite-hex Blade 1.27mm
9-4078	Scribe	9-XL9972MM	Xcelite-hex Blade 1.5mm
9-44572	Wrench Open End 3/8 - 7/16	9-XL9973MM	Xcelite-hex Blade 2 mm
9-44579	Wrench Open End 1/2 - 9/16	9-XL9974MM	Xcelite-hex Blade 2.5mm
9-44579	Wrench Open End 1/2 - 9/16	9-XL9975MM	Xcelite-hex Blade 3mm
9-45385	Pliers, Arc Joint 7 inch	9-XL9976MM	Xcelite-hex Blade 4mm
9-45378	Pliers, Slip Joint	9-XL9977MM	Xcelite-hex Blade 5mm
9-4518	Pliers, Long Nose, Miniature	9-XL991CM	Handle
9-4518	Pliers, Long Nose, Miniature	C2356E	Screw starter - Kedman Quick Wedge
9-44776	Ignition Wrench Set, 10 pc.	BLBO	Box - 18 Compartment
9-44601	Wrench, Adj., 4 inch	DWL4283T	Box - 5 Compartment
9-4151	Screwdriver, Blade, Stubby	9-41322	Pickup Tool, Claw type
9-41421	Screwdriver, Blade, Pocket clip	9-6757	6 pc Needle File Set
9-41594	Screwdriver, Blade 1/8 in. x 4 in.	9-9487	Utility Knife
9-41581	Screwdriver, Blade 3/16 in. x 4 in.	9-45341	Pliers Vice Grip 10 inch
9-39451	20' Steel Tape, locking Spring load	9-3001	Xacto Pen Knife
9-GH807	Ratchet, Offset, Slotted	9-HT62002	Solder Aid, Fork and Hook
68-412	Ratchet, Offset, Phillips	9-4099	Mirror, Round, Telescoping
9-GH130	Tapered Reamer	9-GH3001	Steel Rule Decimal 6 inch
9-41584	Screwdriver, slotted 1/4 in.X 6 in.	9-GH300ME	Steel Rule Metric 6 inch
9-4118	Screwdriver, Phillips #2, Stubby	9-XL9920	Xcelite-hex Blade .050 inch
9-41293	Screwdriver, Phillips #0	9-XL9921	Xcelite-hex Blade 1/16 inch
9-41294	Screwdriver, Phillips #1	9-XL9922	Xcelite-hex Blade 5/16 inch
9-41295	Screwdriver, Phillips #2	9-XL9923	Xcelite-hex Blade 3/32 inch
9-46677	Hex Keys, 20 pc., Metric	9-XL9924	Xcelite-hex Blade 1/8 inch
9-34701	1/4 in. Standard.Socket set (19 pc)	9-XL9925	Xcelite-hex Blade 5/32 inch
9-43499	1/2 inch Socket 1/4 inch drive	9-XL9926	Xcelite-hex Blade 3/16 inch
9-4355	Flex Spinner	9-XL99764	Xcelite-hex Blade 7/64
9-43523	Breaker	9-XL99964	Xcelite-hex Blade 9/64
9-43531	6 inch Ext.	9-XLM60	Mini-screwdriver kit

Table 10-3 Overview of GE-1 Tool Kit Contents (Continued)

Tool ID	Description	Tool ID	Description
9-65283	Case 8.5 in. x 4.5 in. x 2 in. Deep	9-45072	Pliers 6 inch Diagonal
9-46696	Hex Keys	9-XL100X	Wire Stripper/Cutter 5 inch - 100X
9-39829	Torpedo Level, Magnetic	9-XL87CG	Pliers - very fine needle nose-87CG
9-38461	Hammer, Ball Peen, 4 oz	9-WEWDT-07	Weller-Soldering-Replacement Tip(1)
9-4280	Universal Joint 1/4 inch	9-WS175-E	Wiss - Surgical Scissors
9-WEW60P3	Weller - Soldering Iron, 3 wire	KH174	Hemostat 5 inch Straight
9-WECT5B6	Weller - Soldering Iron Tip	KH175	Hemostat 5 inch curved
9-WEWDP12	Weller - Desoldering Pump	9-Z9480121	Alignment tool (red)
93383	Flashlight Mini-Mag Lite (AAA Bat.)		
9-GH408	Tweezers		
21576	Brush - Bristle		
9-4516	Pliers 4 1/4 inch Diagonal		

Table 10-4 Overview of GE-2 Tool Kit Contents(Continued)

GE-2 Sears Kit (#99034)			
Tool ID	Description	Tool ID	Description
9-45381	Pliers, Arc Joint 9 1/2 inch	9-44067	Socket 1 1/16 in. for 1/2 in. drive
9-45092	Pliers, Linesman 8 1/2 inch	9-42679	Socket 10MM Hex for 1/2 in. drive (2273333)
9-42882	Punch, Pin 3/32 inch	9-44262	Extension 10 inch for 1/2 in. drive (2273405)
9-42884	Punch, Pin 5/32 inch	9-4258	3/8 inch to 1/2 inch Adapter
9-42886	Punch, Pin 1/4 inch	9-34374	3/8 inch Metric Socket Set - 12 PT
9-42973	Cold Chisel 1/2 inch	9-44311	16mm Socket 12 pt.
9-GH77	Center Punch Automatic	9-33485	Metal Socket Tray
9-GH890	File Handle, Adj.	9-33484	Metal Socket Tray
9-31276	File, Round, Bastard 8 inch	9-33484	Metal Socket Tray
9-31277	File, Half Round, Bastard 8 inch	9-52068	Tap and Drill Set
9-31263	File, Flat Mill 8 inch	9-52722	#6 Tap
21045C	Close Quarter Saw	9-52723	#8 Tap
9-44604	Wrench, Adj 10 inch		High Speed Drill Set
9-41587	Screwdriver 5/16 inch x 8 inch		#36 Drill
9-41586	Screwdriver, Stubby 5/16 inch		#29 Drill
9-GH19512	Countersink 1/2 inch	9-44046	3/8 inch Socket Set
9-44741	12 PC Combination Wrench Set		

10-4-2 Special Tools, Supplies and Equipment

10-4-2-1 Specific Requirements for Care & Maintenance

Table 10-5 Overview of Requirements for Care & Maintenance

Tool	Part Number	Comments
Digital Volt Meter (DVM)		
Leakage Current Ultrasound Kit	2113015	For 120V and 220V Units
Anti Static Kit	46-194427P231 46-194427P279 46-194427P369 46-194427P373 46-194427P370	Kit includes anti-static mat, wrist strap and cables for 200 to 240 V system 3M #2204 Large adjustable wrist strap 3M #2214 Small adjustable wrist strap 3M #3051 conductive ground cord
Anti Static Vacuum Cleaner	46-194427P278 46-194427P279	120V 230V
Air Filter		air intake
Safety Analyzer		The Safety Analyzer tool should be calibrated and compliant with AAMI/ESI 1993 or IEC 60601 or AS/NZS 3551
SVHS VCR Cassette	E7010GG E7010GF	60 minute 120 minute
SVHS VCR Head Cleaner		See VCR user manual for requirements
3.5" MOD MEDIA	E8381AA E8381AB	blank 128 M disk blank 230 M disk
5.25" MOD Media		
3.5" MOD Media Cleaner	2117811	cleans the diskettes
5.25" MOD Media Cleaner		cleans the diskettes
3.5" MOD Head Cleaner Kit	2148392	cleans the drive heads
5.25" MOD Head Cleaner Kit		cleans the drive heads
QIQ Phantom	E8370RB	RMI Grayscale Target Model 403GS
B/W Printer Cleaning Sheet		See printer user manual for requirements
Color Printer Cleaning Sheet		See printer user manual for requirements
Disposable Gloves		

10-4-3 Input Power

10-4-3-1 Mains Cable Inspection

Table 10-6 Mains Cable Inspection

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	Verify	Verify that the LINE, NEUTRAL and GROUND wires are properly attached to the terminals, and that no strands may cause a short circuit.
4	Verify	Inlet connector retainer is functional.

10-4-4 Cleaning

10-4-4-1 General Cleaning

Table 10-7 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.
2	Probe Holder	Clean probe holders (they may need to be soaked to remove excess gel).

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.

10-4-5 Physical Inspection

Table 10-8 Physical Checks

Step	Item	Description
1	Labeling	Verify that all system labeling is present and in readable condition. refer to the LOGIQ C3/C5 Premium User Manual for details.
2	Scratches & Dents	Inspect the console for dents, scratches or cracks.
3	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 caster locks and caster swivel locks for proper operation.
4	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.
5	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 while scanning.
6	External I/O	Check all connectors for damage and verify that the labeling is good.
7	Op Panel Lights	Check for proper operation of all operator panel and TGC lights.
8	Monitor Light	Check for proper operation of any monitor lights if available.
9	External Microphone	Check for proper operation of any external microphones by recording an audio test.

10-4-6 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.

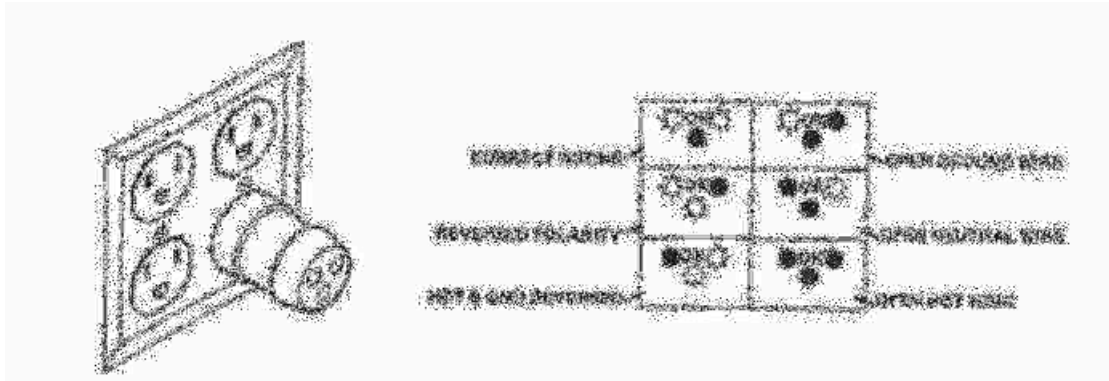


Figure 10-1 Typical Outlet Tester

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.*

10-4-7 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 metal parts of the case. The ground wire resistance should be less than 0.2 ohms. Reference the procedure in the IEC 601-1.1.

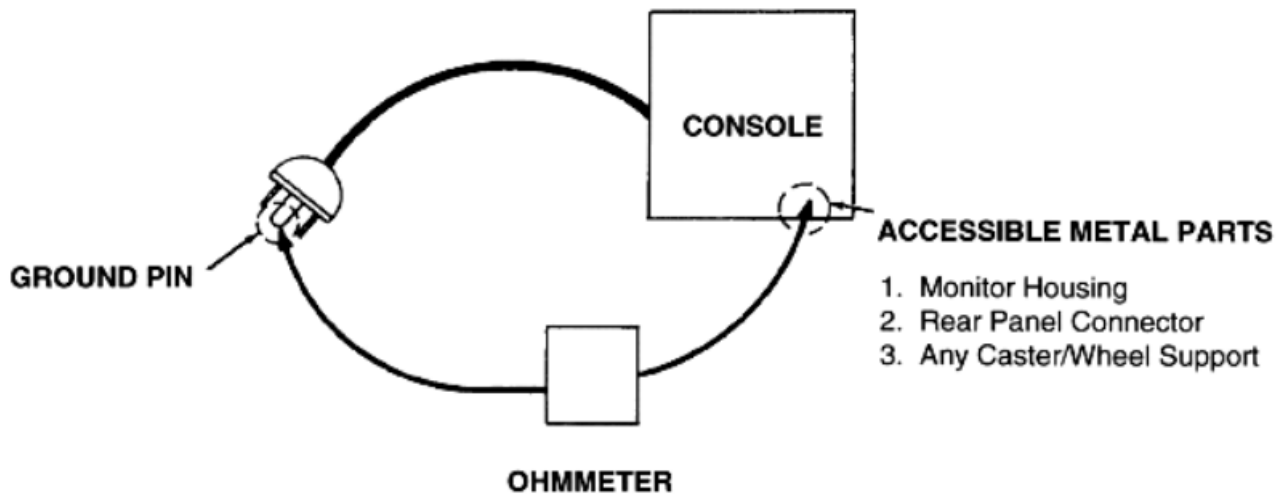


Figure 10-2 Ground Continuity Test

10-4-7-1 Meter Procedure

Follow these steps to test the ground wire resistance.


- 1.) Turn the LOGIQ C3/C5 Premium unit OFF.
- 2.) Plug the unit into the meter, and the meter into the tested AC wall outlet.
- 3.) Plug the black chassis cable into the meter's "CHASSIS" connector and attach the black chassis cable clamp to an exposed metal part of the LOGIQ C3/C5 Premium unit.
- 4.) Set the meter's "FUNCTION" switch to the RESISTANCE position.
- 5.) Set the meter's "POLARITY" switch to the OFF (center) position.
- 6.) Measure and record the ground wire resistance.

10-4-8 Chassis Leakage Current Test

10-4-8-1 Definition

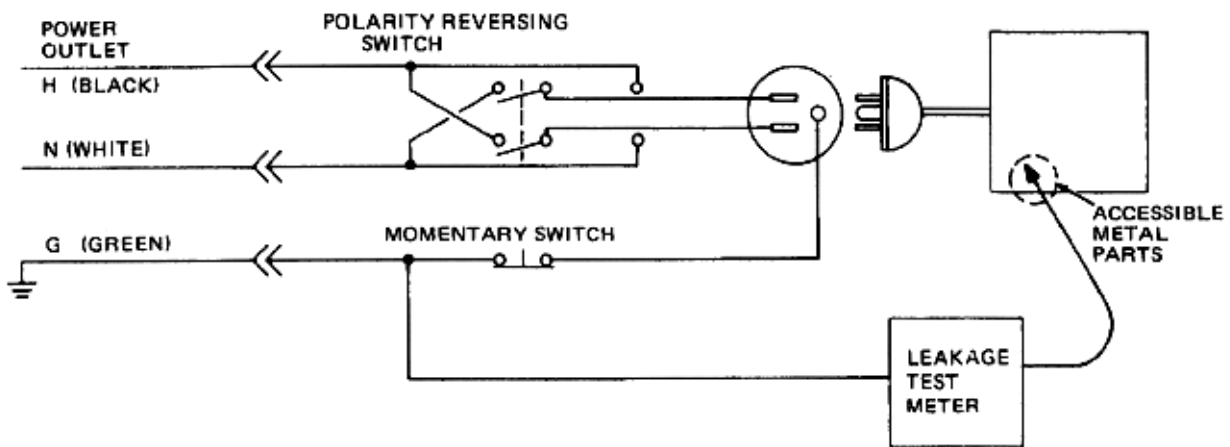
This test measures the current that would flow in a grounded person who touched accessible metal parts of the bedside station if the ground wire should break. The test verifies the isolation of the power line from the chassis. The meter is connected from accessible metal parts of the case to ground. Measurements should be made with the unit On and Off, with the power line polarity Normal and Reversed. Record the highest reading.

 **CAUTION Electric Shock Hazard. When the meter's ground switch is OPEN, don't touch the unit!**

 **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.**

10-4-8-2 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 with the unit ON and OFF, with the power line polarity Normal and Reversed. Record the highest reading of current.



**Figure 10-3 Set Up for Chassis Source Leakage Current,
IEC 601-1 Clause 19 - Continuous Leakage Currents and
Patient, Auxiliary Currents**

When using the Microguard or a similar test instrument, its power plug may be inserted into the wall outlet and the equipment under test is plugged into the receptacle on the panel of the meter. This places the meter in the grounding conductor and the current flowing from the case to ground will be indicated in any of the current ranges. The maximum allowable limit for chassis source leakage is shown in [Table 10-12](#).

10-4-9 Isolated Patient Lead (Source) Leakage–Lead to Lead

Reference the procedure in the IEC 60601-1. Select and test each of the five ECG lead positions (except ALL) on the LEAD selector, testing each to the power condition combinations found in the table. Record the highest leakage current measured.

10-4-10 Isolated Patient Lead (Sink) Leakage-Isolation Test

reference the procedure in the IEC 60601-1. Select the ALL position on the lead selector. Depress the rocker switch to ISO TEST to test lead isolation.



CAUTION Line voltage is applied to the ECG leads during this test. To avoid possible electric shock hazard, the system being tested must not be touched by patients, users or anyone while the ISO TEST switch is depressed.

NOTE: *It is not necessary to test each lead individually or power condition combinations as required in previous tests.*

10-4-10-1 Data Sheet for ECG Leakage Current

The test passes when all readings measure less than the value shown in the table below. Record all data on the PM Inspection Certificate.

Table 10-9 Maximum Allowance Limit for ECG Leakage Current

	AC Power Source	Maximum Allowance Limit	
		GROUND OPEN	GROUND CLOSED
Patient Lead to Ground Leakage Current Test and Patient Lead to Lead Leakage Current Test	115V	10uA	10uA
	220/240V	500uA	10uA

Table 10-10 Maximum Allowance Limit for ECG Leakage Current

	AC Power Source	Maximum Allowance Limit
Patient Lead Isolation Current Test	115V	20uA
	220/240V	5mA

Table 10-11 Typical Data Sheet for ECG Leakage Current

ECG Power	Tester Polarity Switch	Tester Ground Switch	Tester Lead Selector				
			RL	RA	LA	LL	C
ON	NORM	CLOSED					
ON	REVERSE	CLOSED					
ON	NORM	OPEN					
ON	REVERSE	OPEN					
OFF	NORM	CLOSED					
OFF	REVERSE	CLOSED					
OFF	NORM	OPEN					
OFF	REVERSE	OPEN					

10-4-11 Probe Leakage Current Test

10-4-11-1 Definition

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.

10-4-11-2 Generic Procedure

Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with the unit Off and On. For each combination, the probe must be active to find the worst case condition.

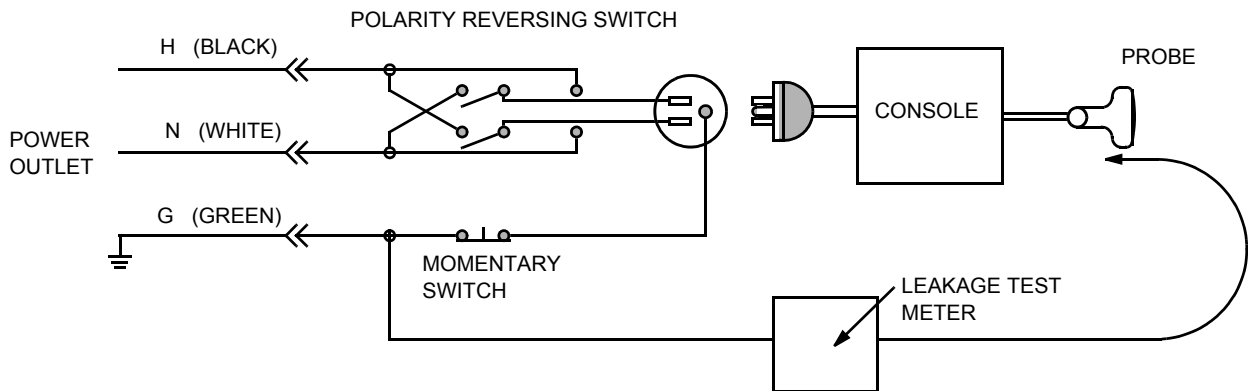


Figure 10-4 Set Up for Probe Leakage Current

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.

10-4-11-3 Meter Procedure Using Probe Adapter

Follow the Safety Analyzer tool instruction to test each transducer for leakage current.

The electrical Safety Analyzer tool should be calibrated and compliant with AMMI/ESI 1993 or IEC 60601 or AS/NZS 3551.

10-4-11-4 No Meter Probe Adapter Procedure

Follow the Safety Analyzer tool instruction to test each transducer for leakage current.

The electrical Safety Analyzer tool should be calibrated and compliant with AMMI/ESI 1993 or IEC 60601 or AS/NZS 3551.

10-4-11-5 Data Sheet for Transducer Source Leakage Current

The test passes when all readings measure less than the values. Record all data on the PM Inspection Certificate.



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

Table 10-12 Typical Data Sheet For Transducer Source Leakage Current

Transducer Tested:			
Unit Power	Tester Power Polarity Switch	Tester GROUND or NEUTRAL Switch	Measurement
ON	NORM	OPEN	
ON	NORM	CLOSED	
ON	REV	OPEN	
ON	REV	CLOSED	
OFF	NORM	OPEN	
OFF	NORM	CLOSED	
OFF	REV	OPEN	
OFF	REV	CLOSED	

Section 10-5 When There's Too Much Leakage Current...

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.

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.*

PROBE FAILS

Test the probe in another connector 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 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 system connector for bent pins, poor connections, and ground continuity.

If the problem remains with the probe, replace the probe.

PERIPHERAL FAILS

Tighten all grounds. Ensure star washers are under all ground studs.

Inspect wiring for bad crimps, poor connections, or damage.

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.

NEW UNIT

If the leakage current measurement tests fail on a new unit and if situation can not be corrected, submit a Safety Failure Report to document the system problem. Remove unit from operation.

ECG FAILS

Inspect cables for damage or poor connections.

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		
Doppler Modes Function		Monitor		
CF-Mode Function		Touch Panel		
M-Mode Function		Air Filter		
Applicable Software Options		Probe Holders		
Applicable Hardware Options		External I/O		
Control Panel		Wheels, Brakes & Swivel Locks		
Monitor		Cables and Connectors		
Touch Panel		GE Approved Peripherals (VCR, CD-RW, MOD, Printers)		
Measurement Accuracy				
GE Approved Peripherals				

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 - Caster				
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 1 Ground Continuity				
Peripheral 2 Leakage Current				
Peripheral 2 Ground Continuity				
Peripheral 3 Leakage Current				
Peripheral 3 Ground 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.

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GE-GE Medical Systems Ultrasound.
9900 Innovation Drive
Wauwatosa, Wisconsin 53226
USA

