

GE Healthcare

MUSE™ NX  
Cardiology Information System  
Service Manual

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MUSE™ NX  
Cardiology Information System  
English  
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## Publication Information

The information in this manual applies only to the MUSE™ NX Cardiology Information System. It does not apply to earlier product versions. Due to continuing product innovation, specifications in this manual are subject to change without notice.

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This product complies with the requirements concerning medical devices from the following regulatory bodies.



For more information about compliance, refer to the *Regulatory and Safety Guide* for this product.

The document part number and revision are on each page of the document. The revision identifies the document's update level. The revision history of this document is summarized in the following table.

Revision	Date	Comment
A	30 October 2018	Customer release.

To access other GE Healthcare Diagnostic Cardiology documents, go to the Common Documentation Library (CDL), located at <http://apps.gehealthcare.com/servlet/ClientServlet>, and select **Cardiology**.

To access Original Equipment Manufacturer (OEM) documents, go to the device manufacturer's website.

This document describes the MUSE™ NX Cardiology Information System, also referred to as the "product," "system," or "device." This document is intended to be used by an operator of the MUSE system.

The MUSE™ NX Cardiology Information System is intended to be used under the direct supervision of a licensed healthcare practitioner, by trained operators in a hospital or facility providing patient care.

This document provides information required for the proper use of the system. Familiarize yourself with this information and read and understand all instructions before attempting to use this system. Keep this document with the Regulatory and Safety manual, and with the equipment at all times, and periodically review it.

Illustrations in this document are provided as examples only. Depending on system configuration, screens in the document may differ from the screens on your system. Patient names and data are fictitious. Any similarity to actual persons is coincidental.

## Support

GE Healthcare maintains a trained staff of application and technical experts to answer questions and to respond to issues and problems that may arise during the installation, maintenance, and use of this product.

If you require additional assistance, contact your GE Healthcare representative, or GE Healthcare support at one of the following numbers:

- North America: 1-800-558-7044
- Europe: +49 761 45 43 -0
- Asia: +86 21 3877 7888

## Training

This document is intended as a supplement to, not a substitute for, thorough product training. If you have not received training on the use of the product, you should request training assistance from GE Healthcare.

To see available training, go to the GE Healthcare training website [www.gehealthcare.com/training](http://www.gehealthcare.com/training).

For more self-paced course offerings, tools, and reference guides you may find useful, visit the GE Healthcare Education Store at [www.gehealthcare.com/educationstore](http://www.gehealthcare.com/educationstore).

## Service Manual Language Information

WARNING (EN)	<p>This service manual is available in English only.</p> <ul style="list-style-type: none"> <li>• If a customer's service provider requires a language other than English, it is the customer's responsibility to provide translation services.</li> <li>• Do not attempt to service the equipment unless this service manual has been consulted and is understood.</li> <li>• Failure to heed this warning may result in injury to the service provider, operator, or patient, from electric shock, mechanical or other hazards.</li> </ul>
ПРЕДУПРЕЖДЕНИЕ (BG)	<p>Това упътване за работа е налично само на английски език.</p> <ul style="list-style-type: none"> <li>• Ако доставчикът на услугата на клиента изиска друг език, задължение на клиента е да осигури превод.</li> <li>• Не използвайте оборудването, преди да сте се консултирали и разбрали упътването за работа.</li> <li>• Неспазването на това предупреждение може да доведе до нараняване на доставчика на услугата, оператора или пациент в резултат на токов удар или механична или друга опасност.</li> </ul>
警告 (ZH-CN)	<p>本维修手册仅提供英文版本。</p> <ul style="list-style-type: none"> <li>• 如果维修服务提供商需要非英文版本，客户需自行提供翻译服务。</li> <li>• 未详细阅读和完全理解本维修手册之前，不得进行维修。</li> <li>• 忽略本警告可能对维修人员，操作员或患者造成触电、机械伤害或其他形式的伤害。</li> </ul>
警告 (ZH-TW)	<p>本維修手冊只提供英文版。</p> <ul style="list-style-type: none"> <li>• 如果客戶的維修人員有英語以外的其他語言版本需求，則由該客戶負責 提供翻譯服務。</li> <li>• 除非您已詳閱本維修手冊並了解其內容，否則切勿嘗試對本設備進行維修。</li> <li>• 不重視本警告可能導致維修人員、操作人員或病患因電擊、機械因素或 其他因素而受到傷害。</li> </ul>
UPOZORENJE (HR)	<p>Ove upute za servisiranje dostupne su samo na engleskom jeziku.</p> <ul style="list-style-type: none"> <li>• Ukoliko korisnički servis zahtijeva neki drugi jezik, korisnikova je odgovornost osigurati odgovarajući prijevod.</li> <li>• Nemojte pokušavati servisirati opremu ukoliko niste konzultirali i razumjeli ove upute.</li> <li>• Nepoštivanje ovog upozorenja može rezultirati ozljedama servisnog osoblja, korisnika ili pacijenta prouzročenim električnim udarom te mehaničkim ili nekim drugim opasnostima.</li> </ul>

VAROVÁNÍ (CS)	<p>Tento provozní návod existuje pouze v anglickém jazyce.</p> <ul style="list-style-type: none"> <li>• V případě, že externí služba zákazníkům potřebuje návod v jiném jazyce, je zajištění překladu do odpovídajícího jazyka úkolem zákazníka.</li> <li>• Nesnažte se o údržbu tohoto zařízení, aniž byste si přečetli tento provozní návod a pochopili jeho obsah.</li> <li>• V případě nedodržování této varování může dojít k poranění pracovníka prodejního servisu, obslužného personálu nebo pacientů vlivem elektrického proudu, respektive vlivem mechanických či jiných rizik.</li> </ul>
ADVARSEL (DA)	<p>Denne servicemanual findes kun på engelsk.</p> <ul style="list-style-type: none"> <li>• Hvis en kundes tekniker har brug for et andet sprog end engelsk, er det kundens ansvar at sørge for oversættelse.</li> <li>• Forsøg ikke at servicere udstyret medmindre denne servicemanual har været konsulteret og er forstået.</li> <li>• Manglende overholdelse af denne advarsel kan medføre skade på grund af elektrisk, mekanisk eller anden fare for teknikeren, operatøren eller patienten.</li> </ul>
WAARSCHUWING (NL)	<p>Deze service manual is alleen in het Engels verkrijgbaar.</p> <ul style="list-style-type: none"> <li>• Indien het onderhoudspersoneel een andere taal nodig heeft, dan is de klant verantwoordelijk voor de vertaling ervan.</li> <li>• Probeer de apparatuur niet te onderhouden voordat deze service manual geraadpleegd en begrepen is.</li> <li>• Indien deze waarschuwing niet wordt opgevolgd, zou het onderhoudspersoneel, de gebruiker of een patiënt gewond kunnen raken als gevolg van een elektrische schok, mechanische of andere gevaren.</li> </ul>
HOIATUS (ET)	<p>Käesolev teenindusjuhend on saadaval ainult inglise keeles.</p> <ul style="list-style-type: none"> <li>• Kui klienditeeninduse osutaja nõuab juhendit inglise keelest erinevas keeles, vastutab klient tõlketeenuse osutamise eest.</li> <li>• Ärge üritage seadmeid teenindada enne eelnevalt käesoleva teenindusjuhendiga tutvumist ja sellest aru saamist.</li> <li>• Käesoleva hoiatuse eiramine võib põhjustada teenuseosutaja, operaatori või patsiendi vigastamist elektrilöögi, mehaanilise või muu ohu tagajärjel.</li> </ul>
VAROITUS (FI)	<p>Tämä huolto-ohje on saatavilla vain englanniksi.</p> <ul style="list-style-type: none"> <li>• Jos asiakkaan huoltohenkilöstö vaatii muuta kuin englanninkielistä materiaalia, tarvittavan käännöksen hankkiminen on asiakkaan vastuulla.</li> <li>• Älä yritä korjata laitteistoa ennen kuin olet varmasti lukenut ja ymmärtänyt tämän huolto-ohjeen.</li> <li>• Mikäli tätä varoitusta ei noudateta, seurauksena voi olla huoltohenkilöstön, laitteiston käyttäjän tai potilaan vahingoittuminen sähköiskun, mekaanisen vian tai muun vaaratilanteen vuoksi.</li> </ul>

ATTENTION (FR)	<p>Ce manuel technique n'est disponible qu'en anglais.</p> <ul style="list-style-type: none"> <li>• Si un service technique client souhaite obtenir ce manuel dans une autre langue que l'anglais, il devra prendre en charge la traduction et la responsabilité du contenu.</li> <li>• Ne pas tenter d'intervenir sur les équipements tant que le manuel technique n'a pas été consulté et compris.</li> <li>• 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.</li> </ul>
WARNUNG (DE)	<p>Diese Serviceanleitung ist nur in englischer Sprache verfügbar.</p> <ul style="list-style-type: none"> <li>• Falls der Kundendienst eine andere Sprache benötigt, muss er für eine entsprechende Übersetzung sorgen.</li> <li>• Keine Wartung durchführen, ohne diese Serviceanleitung gelesen und verstanden zu haben.</li> <li>• Bei Zuwiderhandlung kann es zu Verletzungen des Kundendiensttechnikers, des Anwenders oder des Patienten durch Stromschläge, mechanische oder sonstige Gefahren kommen.</li> </ul>
FIGYELMEZTETÉS (HU)	<p>Ez a szerviz kézikönyv kizárólag angol nyelven érhető el.</p> <ul style="list-style-type: none"> <li>• Ha a vevő szerviz ellátója angoltól eltérő nyelvre tart igényt, akkor a vevő felelőssége a fordítás elkészítése.</li> <li>• Ne próbálja elkezdni használni a berendezést, amíg a szerviz kézikönyvben leírtakat nem értelmezték és értették meg.</li> <li>• Ezen figyelmeztetés figyelmen kívül hagyása a szerviz ellátó, a működtető vagy a páciens áramütés, mechanikai vagy egyéb veszélyhelyzet miatti sérülését eredményezheti.</li> </ul>
AÐVÖRUN (IS)	<p>Þessi þjónustuhandbók er eingöngu áanleg á ensku.</p> <ul style="list-style-type: none"> <li>• Ef að þjónustuveitandi viðskiptamanns þarfnast annars tungumáls en ensku, er það skylda viðskiptamanns að skaffa tungumálþjónustu.</li> <li>• Reynið ekki að afgreiða tækið nema þessi þjónustuhandbók hefur verið skoðuð og skilin.</li> <li>• Brot á að sinna þessari aðvörun getur leitt til meiðsla á þjónustuveitanda, stjórnanda eða sjúklingi frá raflosti, vélrænum eða öðrum áhættum.</li> </ul>
PERINGATAN (ID)	<p>Manual servis ini hanya tersedia dalam bahasa Inggris.</p> <ul style="list-style-type: none"> <li>• Jika penyedia jasa servis pelanggan memerlukan bahasa lain selain dari Bahasa Inggris, merupakan tanggung jawab dari penyedia jasa servis tersebut untuk menyediakan terjemahannya.</li> <li>• Jangan mencoba melakukan servis terhadap perlengkapan kecuali telah membaca dan memahami manual servis ini.</li> <li>• Mengabaikan peringatan ini bisa mengakibatkan cedera pada penyedia servis, operator, atau pasien, karena terkena kejutan listrik, bahaya mekanis atau bahaya lainnya.</li> </ul>

AVVERTENZA (IT)	<p>Il presente manuale di manutenzione è disponibile soltanto in Inglese.</p> <ul style="list-style-type: none"> <li>• Se un addetto alla manutenzione richiede il manuale in una lingua diversa, il cliente è tenuto a provvedere direttamente alla traduzione.</li> <li>• Si proceda alla manutenzione dell'apparecchiatura solo dopo aver consultato il presente manuale ed averne compreso il contenuto.</li> <li>• Il non rispetto 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.</li> </ul>
警告 (JA)	<p>このサービスマニュアルは英語版しかありません。</p> <ul style="list-style-type: none"> <li>• サービスを担当される業者が英語以外の言語を要求される場合、翻訳作業はその業者の責任で行うものとさせていただきます。</li> <li>• このサービスマニュアルを熟読し、十分に理解をした上で装置のサービスを行ってください。</li> <li>• この警告に従わない場合、サービスを担当される方、操作員あるいは患者が、感電や機械的又はその他の危険により負傷する可能性があります。</li> </ul>
경고 (KO)	<p>본 서비스 지침서는 영어로만 이용하실 수 있습니다.</p> <ul style="list-style-type: none"> <li>• 고객의 서비스 제공자가 영어 이외의 언어를 요구할 경우, 번역 서비스를 제공하는 것은 고객의 책임입니다.</li> <li>• 본 서비스 지침서를 참고했고 이해하지 않는 한은 해당 장비를 수리하려고 시도하지 마십시오.</li> <li>• 이 경고에 유의하지 않으면 전기 쇼크, 기계상의 혹은 다른 위험으로부터 서비스 제공자, 운영자 혹은 환자에게 위험을 가할 수 있습니다.</li> </ul>
ЕСКЕРТУ (KK)	<p>Бул кызмет көрсету бойынша нұскаулығы тек ағылшын тілінде қолжетімді.</p> <ul style="list-style-type: none"> <li>• Тұтынушының қызмет провайдері ағылшын тілінен басқа тілдегі нұсканы талап етсе, аудару бойынша қызметтерімен қамтамасыз ету тұтынушы жауапкершілігінде болуы тиіс.</li> <li>• Бул кызмет көрсету бойынша нұскаулығын назарға алып, түсінбегенше, жабдыққа қызмет көрсетуден бас тартыңыз.</li> <li>• Бул ескертуді елемей кызмет провайдері, оператор немесе емделушінің электр шоғынан, механикалық немесе басқа қауіптер нәтижесінде жарақат алуына әкелуі мүмкін.</li> </ul>
BRĪDINĀJUMS (LV)	<p>Šī apkopotāju rokasgrāmata ir pieejama tikai angļu valodā.</p> <ul style="list-style-type: none"> <li>• Ja apkalošanas sniedzējam nepieciešama informācija citā, nevis angļu, valodā, klienta pienākums ir nodrošināt tās tulkošanu.</li> <li>• Neveiciet aprīkojuma apkopi, neizlasot un nesaprotot apkopotāju rokasgrāmatu.</li> <li>• Šī brīdinājuma neievērošana var radīt elektriskās strāvas trieciena, mehānisku vai citu risku izraisītu traumu apkopes sniedzējam, operatoram vai pacientam.</li> </ul>

ĮSPĖJIMAS (LT)	<p>Šis eksploatavimo vadovas yra prieinamas tik anglų kalba.</p> <ul style="list-style-type: none"> <li>• Jei kliento paslaugų tiekėjas reikalauja vadovo kita kalba - ne anglų, numatyti vertimo paslaugas yra kliento atsakomybė.</li> <li>• Nemėginkite atlikti įrangos techninės priežiūros, nebent atsižvelgėte į šį eksploatavimo vadovą ir jį supratote.</li> <li>• Jei neatkreipsite dėmesio į šį perspėjimą, galimi sužalojimai dėl elektros šoko, mechaninių ar kitų paslaugų tiekėjui, operatoriui ar pacientui.</li> </ul>
ADVARSEL (NO)	<p>Denne servicehåndboken finnes bare på engelsk.</p> <ul style="list-style-type: none"> <li>• Hvis kundens serviceleverandør trenger et annet språk, er det kundens ansvar å sørge for oversettelse.</li> <li>• Ikke forsøk å reparere utstyret uten at denne servicehåndboken er lest og forstått.</li> <li>• Manglende hensyn til denne advarselen kan føre til at serviceleverandøren, operatøren eller pasienten skades på grunn av elektrisk støt, mekaniske eller andre farer.</li> </ul>
OSTRZEŻENIE (PL)	<p>Niniejszy podręcznik serwisowy dostępny jest jedynie w języku angielskim.</p> <ul style="list-style-type: none"> <li>• Jeśli dostawca usług klienta wymaga języka innego niż angielski, zapewnienie usługi tłumaczenia jest obowiązkiem klienta.</li> <li>• Nie należy serwisować wyposażenia bez zapoznania się i zrozumienia niniejszego podręcznika serwisowego.</li> <li>• Niezastosowanie się do tego ostrzeżenia może spowodować urazy dostawcy usług, operatora lub pacjenta w wyniku porażenia elektrycznego, zagrożenia mechanicznego bądź innego.</li> </ul>
AVISO (PT-BR)	<p>Este manual de assistência técnica só se encontra disponível em inglês.</p> <ul style="list-style-type: none"> <li>• Se o serviço de assistência técnica do cliente não for GE, e precisar de outro idioma, será da responsabilidade do cliente fornecer os serviços de tradução.</li> <li>• Não tente reparar o equipamento sem ter consultado e compreendido este manual de assistência técnica.</li> <li>• O não cumprimento deste aviso pode por em perigo a segurança do técnico, operador ou paciente devido a choques elétricos, mecânicos ou outros.</li> </ul>
AVISO (PT-PT)	<p>Este manual técnico só se encontra disponível em inglês.</p> <ul style="list-style-type: none"> <li>• Se a assistência técnica do cliente solicitar estes manuais noutro idioma, é da responsabilidade do cliente fornecer os serviços de tradução.</li> <li>• Não tente reparar o equipamento sem ter consultado e compreendido este manual técnico.</li> <li>• O não cumprimento deste aviso pode provocar lesões ao técnico, ao utilizador ou ao paciente devido a choques eléctricos, mecânicos ou outros.</li> </ul>

AVERTISMENT (RO)	<p>Acest manual de service este disponibil numai în limba engleză.</p> <ul style="list-style-type: none"> <li>• Dacă un furnizor de servicii pentru clienți necesită o altă limbă decât cea engleză, este de datoria clientului să furnizeze o traducere.</li> <li>• Nu încercați să reparați echipamentul decât ulterior consultării și înțelegerii acestui manual de service.</li> <li>• Ignorarea acestui avertisment ar putea duce la rănirea depanatorului, operatorului sau pacientului în urma pericolelor de electrocutare, mecanice sau de altă natură.</li> </ul>
ПРЕДУПРЕЖДЕНИЕ (RU)	<p>Настоящее руководство по обслуживанию предлагается только на английском языке.</p> <ul style="list-style-type: none"> <li>• Если сервисному персоналу клиента необходимо руководство не на английском, а на каком-то другом языке, клиенту следует обеспечить перевод самостоятельно.</li> <li>• Прежде чем приступать к обслуживанию оборудования, обязательно обратитесь к настоящему руководству и внимательно изучите изложенные в нем сведения.</li> <li>• Несоблюдение требований данного предупреждения может привести к тому, что специалисты по обслуживанию, операторы или пациенты получат удар электрическим током, механическую травму или другое повреждение.</li> </ul>
UPOZORENJE (SR)	<p>Ovo servisno uputstvo je dostupno samo na engleskom jeziku.</p> <ul style="list-style-type: none"> <li>• Ako klijentov serviser zahteva neki drugi jezik, klijent je dužan da obezbedi prevodilačke usluge.</li> <li>• Ne pokušavajte da opravite uređaj ako niste pročitali i razumeli ovo servisno uputstvo.</li> <li>• Zanemarivanje ovog upozorenja može dovesti do povređivanja serviser, rukovaoca ili pacijenta usled strujnog udara, ili mehaničkih i drugih opasnosti.</li> </ul>
VAROVANIE (SK)	<p>Tento návod na obsluhu je k dispozícii len v angličtine.</p> <ul style="list-style-type: none"> <li>• Ak zákazníkovi poskytovateľ služieb vyžaduje iný jazyk ako angličtinu, poskytnutie prekladateľských služieb je zodpovednosťou zákazníka.</li> <li>• Nepokúšajte sa o obsluhu zariadenia skôr, ako si neprečítate návod na obsluhu a neporozumiete mu.</li> <li>• Zanedbanie tohto varovania môže vyústiť do zranenia poskytovateľa služieb, obsluhujúcej osoby alebo pacienta elektrickým prúdom, mechanickým alebo iným nebezpečenstvom.</li> </ul>
OPOZORILO (SL)	<p>Ta servisni priročnik je na voljo samo v angleškem jeziku.</p> <ul style="list-style-type: none"> <li>• Če ponudnik storitve stranke potrebuje priročnik v drugem jeziku, mora stranka zagotoviti prevod.</li> <li>• Ne poskušajte servisirati opreme, če tega priročnika niste v celoti prebrali in razumeli.</li> <li>• Če tega opozorila ne upoštevate, se lahko zaradi električnega udara, mehanskih ali drugih nevarnosti poškoduje ponudnik storitev, operater ali bolnik.</li> </ul>



ADVERTENCIA (ES)	<p>Este manual de servicio sólo existe en inglés.</p> <ul style="list-style-type: none"> <li>• Si el encargado de mantenimiento de un cliente necesita un idioma que no sea el inglés, el cliente deberá encargarse de la traducción del manual.</li> <li>• No se deberá dar servicio técnico al equipo, sin haber consultado y comprendido este manual de servicio.</li> <li>• 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.</li> </ul>
VARNING (SV)	<p>Den här servicehandboken finns bara tillgänglig på engelska.</p> <ul style="list-style-type: none"> <li>• Om en kunds servicetekniker har behov av ett annat språk än engelska ansvarar kunden för att tillhandahålla översättningstjänster.</li> <li>• Försök inte utföra service på utrustningen om du inte har läst och förstår den här servicehandboken.</li> <li>• 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.</li> </ul>
UYARI (TR)	<p>Bu servis klavuzunun sadece İngilizcesi mevcuttur.</p> <ul style="list-style-type: none"> <li>• Eğer müşteri teknisyeni bu klavuzu İngilizce dışında bir başka lisandan talep ederse, bunu tercüme ettirmek müşteriye düşer.</li> <li>• Servis klavuzunu okuyup anlamadan ekipmanlara müdahale etmeyiniz.</li> <li>• Bu uyarya uyulmaması, elektrik, mekanik veya diğer tehlikelerden dolayı teknisyen, operatör veya hastanın yaralanmasına yol açabilir.</li> </ul>
ЗАСТЕРЕЖЕННЯ (UK)	<p>Дане керівництво з сервісного обслуговування постачається виключно англійською мовою.</p> <ul style="list-style-type: none"> <li>• Якщо сервісний інженер потребує керівництво іншою мовою, користувач зобов'язаний забезпечити послуги перекладача.</li> <li>• Не намагайтеся здійснювати технічне обслуговування даного обладнання, якщо ви не читали, або не зрозуміли інформацію, надану в керівництві з сервісного обслуговування.</li> <li>• Недотримання цього застереження може призвести до травмування сервісного інженера, користувача даного обладнання або пацієнта внаслідок електричного шоку, механічного ушкодження або з інших причин невірної обслуговування обладнання.</li> </ul>
CẢNH BÁO (VI)	<p>Tài Liệu Hướng Dẫn Sửa Chữa chỉ có bản tiếng Anh.</p> <ul style="list-style-type: none"> <li>• Nếu các đơn vị cung cấp dịch vụ cho khách hàng yêu cầu một ngôn ngữ nào khác tiếng Anh, thì khách hàng sẽ có trách nhiệm cung cấp các dịch vụ dịch thuật.</li> <li>• Không được sửa chữa thiết bị trừ khi đã tham khảo và hiểu Tài liệu Hướng dẫn Sửa chữa.</li> <li>• Không tuân thủ những cảnh báo này có thể dẫn đến các tổn thương cho người thực hiện sửa chữa, người vận hành hay bệnh nhân, do sốc điện, các rủi ro về cơ khí hay các rủi ro khác</li> </ul>

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## 1

## Product Overview

The MUSE system is intended to store, access, and manage cardiovascular information on adult and pediatric patients. With the MUSE system, you can review, measure, and edit electrocardiographic procedures on screen. The system also provides ECG serial comparison and digitized waveforms.

This software system stores ECGs generated by a computerized analysis program that is used to interpret ECG tracings. This computerized interpretation is only significant when used in conjunction with clinical findings.

The MUSE system can be connected to non-GE Healthcare equipment that is recommended by GE Healthcare and meets the appropriate criteria.

## Safety Conventions

A **hazard** is a source of potential injury to a person, property, or the system.

This manual uses the terms DANGER, WARNING, CAUTION, and NOTICE to indicate hazards with a designated degree of seriousness. Familiarize yourself with the following definitions and their significance.

**Table 1: Definitions of Safety Conventions**

<b>Safety Convention</b>	<b>Definition</b>
<b>DANGER</b>	An imminent hazard that if not avoided will result in death or serious injury.
<b>WARNING</b>	A potential hazard or unsafe practice that if not avoided could result in death or serious injury.
<b>CAUTION</b>	A potential hazard or unsafe practice that if not avoided could result in moderate or minor injury.
<b>NOTICE</b>	A potential hazard or unsafe practice that if not avoided could result in the loss or destruction of property or data.

## Safety Hazards

The following safety messages alert you to potential hazardous conditions that could arise during the normal use of this product and recommend steps to avoid such conditions

**CAUTION:**

**DATA LOSS OR CORRUPTION** - Installing software not specified by GE Healthcare may damage the equipment or delete or corrupt data.

Do not load any software onto your system other than that specified by GE Healthcare.

**CAUTION:**

**STOPPING A SERVICE DISABLES THAT FUNCTION**

Do not stop services unless you understand how it affects the system, or unless all users are logged off the system.

**CAUTION:**

**SYSTEM FAILURE** - Running in Modify Mode exposes critical MUSE system configuration settings. Unintended or poorly implemented changes to the MUSE configuration can result in the MUSE system failing.

Do not launch the MUSE system in Modify Mode unless you are trained and understand how your changes affect the MUSE system.

**CAUTION:**

**DATA LOSS** - Changing settings without knowing how they affect the system can cause data loss.

Do not change any current settings unless you understand how the change affect the system.

**CAUTION:**

**DATA LOSS** - MUSE service may automatically restart after making changes to the installation configurations.

To avoid losing changes to open records, schedule a maintenance downtime with the customer before making changes.

## Common Terms

<i>Term</i>	<i>Definition</i>
AD	<b>Active Directory</b> is a directory service developed by Microsoft for Windows domain networks. It is included in most Windows Server operating systems as a set of processes and services.
ADSI	<b>Active Directory Service Interfaces</b> is a set of COM interfaces used to access the features of directory services from different network providers. ADSI is used in a distributed computing environment to present a single set of directory service interfaces for managing network resources.

<i>Term</i>	<i>Definition</i>
API	<b>Application Program Interface</b> (calling conventions) is an application program that accesses operating system and other services. An API is defined at source code level and provides a level of abstraction between the application and the kernel (or other privileged utilities) to ensure the portability of the code.
archive	Permanent storage of data.
backup	A spare copy of a file, file system or other resource for use in the event of failure or loss of the original.
client/server	A network system where a dedicated computer (server) handles some of the processing tasks while multiple smaller computers (clients) complete other processes by tapping into the server's shared files and programs.
DICOM	<b>Digital Imaging and Communications in Medicine</b> is an industry standard to define connectivity and communication protocols of medical imaging devices. It conforms to the ISO reference model for network communications and incorporates object-oriented design concepts.
fax	<b>Facsimile</b> is a process by which fixed graphic material including pictures, text, or images is scanned and the information converted into electrical signals that are transmitted via telephone to produce a paper copy of the graphics on the receiving fax machine.
file server	A computer dedicated to managing the flow of information among networked computers and used as a storage location for programs and files shared by network users.
FTP	<b>File Transfer Protocol</b> is the method of moving files from system to system using TCP/IP.
gateway	A term for a device that enables data to flow between different networks (forming an internet).
HIS	<b>Hospital Information System</b> is a system that provides the information management features hospitals need for daily business. Typically, this includes patient tracking, billing, and administrative programs. HIS can also include clinical features.
HL7	<b>Health Level 7</b> is a standard interface for exchanging and translating data between computer systems.
IEC	<b>International Electrotechnical Commission</b> is the international standards and conformity assessment body for all fields of electrotechnology.
IIS	<b>Internet Information Server</b> is the name for Microsoft's webserver. It works with server versions of Microsoft's operations systems and was first developed for Windows NT Server.
IP	<b>Internet Protocol</b> is the network layer for the TCP/IP protocol suite widely used on Ethernet networks, defined in STD 5, RFC 791. IP is a connectionless, best-effort packet switching protocol. It provides packet routing, fragmentation, and re-assembly through the data link layer.

<i>Term</i>	<i>Definition</i>
ISO	<b>International Organization for Standardization</b> refers to the ISO file that contain the complete image of a disk. This type of file is commonly used for transferring CD/DVD images over the internet.
LAN	<b>Local Area Network</b> is a data communications network that is geographically limited (typically to a 1 km radius) allowing easy interconnection of terminals, microprocessors, and computers within adjacent buildings.
LDAP	<b>Lightweight Directory Access Protocol</b> is an application protocol used over an IP network to manage and access the distributed directory information service. Active Directory utilizes LDAP.
LED	<b>Light-Emitting Diode</b> is a type of diode that emits light when current passes through it.
NetBIOS	<b>Network Basic Input/Output System</b> is an applications programming interface (API) that activates network operations on IBM PC compatibles running under Microsoft's DOS. It is a set of network commands that the application program issues to transmit and receive data to another host on the network. The commands are interpreted by a network control program or network operating system that is NetBIOS compatible.
NIC	<b>Network Interface Card</b> is an adapter circuit board installed in a computer to provide a physical connection to a network.
ns	<b>Nanosecond</b> is 10 <sup>-9</sup> seconds (one thousand millionth part of a second)
OEM	<b>Original Equipment Manufacturer</b> is a company that makes equipment for example, computers) as opposed to one that sells equipment made by other companies.
OS	<b>Operating System</b> is the program that allows you to access the basic functions of your computer. It is the minimum software required to run a program.
PCL	<b>Printer Control Language</b> is a document description language used by Hewlett-Packard printers.
PDF	<b>Portable Document Format</b> is the native file format for Adobe Systems Acrobat. PDF is the file format for representing documents in a manner that is independent of the original application software, hardware, and operating system used to create those documents.
PING	<b>Packet INternet Groper</b> is a program used to test reachability of destinations by sending them one, or repeated, ICMP echo requests and waiting for replies.
PostScript	A page description language is a programming language used by printers to describe the appearance of a printed page.
RAM	<b>Random Access Memory</b> is a data storage device for which the order of access to different locations does not affect the speed of access.



<i>Term</i>	<i>Definition</i>
ROM	<b>Read-Only Memory</b> is a type of data storage device that is manufactured with fixed contents. In its most general sense, the term might be used for any storage system whose contents cannot be altered. The term is most often applied to semiconductor integrated circuit memories and CD-ROM.
TCP/IP	<b>Transmission Control Protocol over Internet Protocol</b> is the de facto standard Ethernet protocols incorporated into 4.2BSD Unix. TCP/IP was developed for internetworking and encompasses both network layer and transport layer protocols.
UNC	<b>Universal Naming Convention</b> is the name given for the naming used when one specifies: <code>\\the server\the volume\the path\</code> then the file name of a file. An example of a UNC is: <code>\\Myserver\Docdrive\Magazine\glossary.doc</code>

## Installation Media

The MUSE system installation files are delivered by eDelivery. The eDelivery provides ISO files you can download, mount, and install into a virtual environment.

**NOTE:**

Additional software may be available by eDelivery. Use the eDelivery portal to download any software updates.

The following tables describe the basic installation files in the MUSE system file directory.

**Table 2: MUSE System Installation Directory**

<i>Type</i>	<i>Name</i>	<i>Description</i>
Folder	<code>\MuseApplication</code>	The MUSE system application files including the prerequisite files, MUSE Save Setting files, and utilities.
Folder	<code>\MuseWebAPI</code>	Prerequisite files and the MUSE system executable file to install the MUSE Web API.
Folder	<code>\MuseWebUI</code>	Prerequisite files and the MUSE system executable file to install the MUSE Web UI.
File	<code>MuseLauncher.exe</code>	The executable file to launch the MUSE Installer. This can be used to install or modify an installed MUSE system.

Table 3: MUSE CCG

Type	Name	Description
Folder	<b>\MUSE_CCG</b>	MUSE CCG application files
File	<b>MUSE_CCG.iso</b>	ISO of MUSE CCG application files

## MUSE Drive Contents and Supporting Folders

For optimal system performance, it is recommended that the MUSE system application and database are installed on separate servers. The customer may elect to install the MUSE application and database on the same server.

### MUSE Application with Remote Database

When installing the MUSE application and database on separate servers, the following tables list the recommended installation configuration. This is the recommended server setup.

Table 4: MUSE Application Server

Application/Folders	Description
Windows OS	Windows Server
Adobe Reader	Required to display PDF content. Installed with the MUSE system.
SQL Management Studio	Required for access to the MUSE database.
MUSE	MUSE application folder located in <b>C:\Program Files (x86)</b> .
InSite ExC	Enables GE remote support.
<b>Muse</b> data folder	The name and location of the MUSE data folder is specified during MUSE system installation. In a typical installation, the folder name is <b>Muse</b> and includes the following folders: <b>\acq</b> , <b>\backup</b> , <b>\mars</b> , and <b>\xml</b> .
<b>\acq</b>	Default path where the MUSE Generacq service checks for tests. Shared by default for use with CASE/CardioSoft systems.
<b>\mars</b>	Temporarily stores formatted Holter reports ready for printing.
<b>\xml</b>	Temporarily stores inbound XML data (requires <b>XML import</b> option).

Table 5: MUSE Database Server

Application/Folders	Description
SQL Server	Database engine used by the MUSE system
<b>Muse\db</b>	MUSE databases

## MUSE Application with Local Database

When installing the MUSE application and database on the same server, the following tables list the recommended installation configurations.

This is the simplest configuration and it does not require any firewall settings or permissions between the MUSE server and SQL Server databases.

**Table 6: C Drive**

<i>Application</i>	<i>Description</i>
Windows OS	Windows Server
Adobe Reader	Required to display PDF content. Installed with the MUSE system.
SQL Server	Database engine used by the MUSE system
SQL Server Management Studio	Required for support and troubleshooting
MUSE	MUSE application folder located in <b>Program Files</b>
InSite ExC	Enables GE Healthcare remote support

**Table 7: D Drive (MUSE System)**

<i>Folder</i>	<i>Description</i>
<b>db</b>	MUSE databases
<b>acq</b>	Default path where the MUSE Generacq service checks for tests. Shared by default for use with CASE/CardioSoft systems.
<b>mars</b>	Temporarily stores formatted Holter reports ready for printing
<b>xml</b>	Temporarily stores inbound XML data (requires <b>XML import</b> option)

## MUSE Options

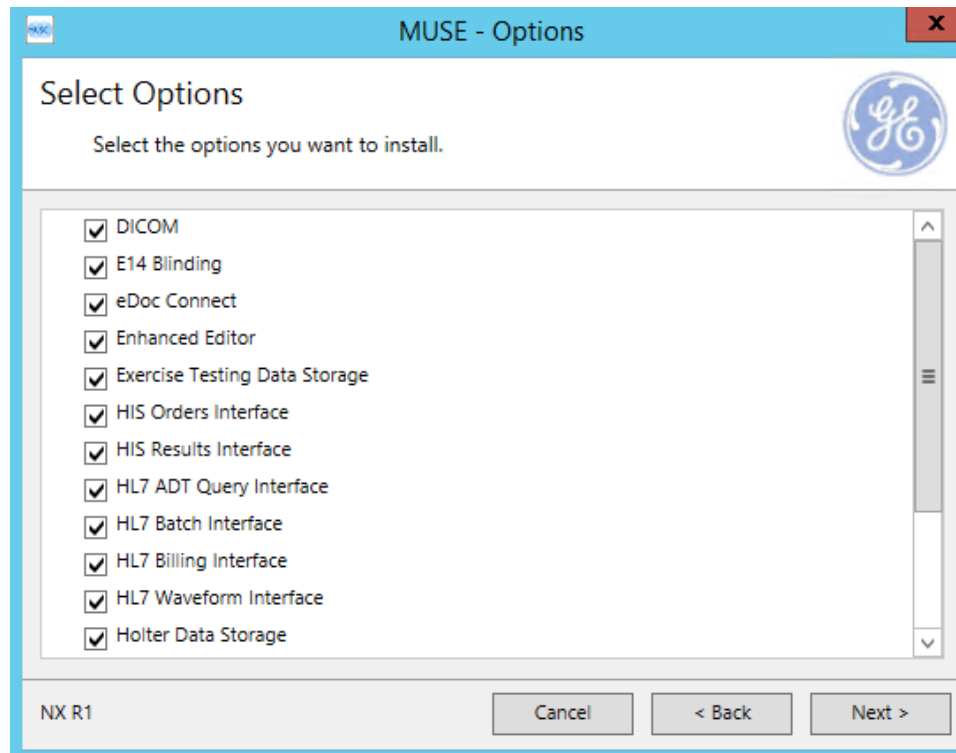
MUSE options enable certain features within the MUSE application.

**NOTE:**

Before viewing or modifying the MUSE system configuration, you must safely shutdown the MUSE system to prevent user access. See ["Schedule a System Shutdown" on page 34](#).

To view a list of install options or to modify MUSE options, go to **Control Panel > Programs > Programs and Features**. Right-click on **MUSE** and select **Change**.

Only authorized GE Healthcare service representatives can install the MUSE options.



Some of the options have related MUSE services required to function correctly. The table below identifies the available MUSE options and the related MUSE service required for the option to function correctly. When troubleshooting specific problems, it may be useful to verify if the corresponding service is running

**Table 8: MUSE Options**

<i>MUSE Option</i>	<i>Related MUSE Service</i>
DICOM	DICOM
E14 Blinding	None
Serial Comparison	None
eDoc Connect Enables storage of third-part electronic documents.	None
Enhanced Editor	None
Exercise Testing Data Storage	None
HIS Orders Interface	HL7 Parser
HIS Results Interface	HL7 Outbound
HL7 ADT Query Interface	HL7 Parser
HL7 Batch Interface	HL7 Outbound

<i>MUSE Option</i>	<i>Related MUSE Service</i>
HL7 Billing Interface	HL7 Outbound
HL7 Waveform Interface	HL7 Outbound
Holter Data Storage	None
Interval Editor	None
Reanalysis	None
Web Editing	None
XML Export	File Copy or FTP Copy
XML Import	XML Parser

The following items are automatically installed with the MUSE system:

- 21 CFR Part 11
- ACI TIPI
- ADT Interface
- Database Search
- DCP Communication
- Email
- HiRes Data Storage
- HiRes P Wave Data Storage
- HL7 Orders Download Interface
- LDAP Authentication
- Resting ECG Data Storage
- Serial Comparison
- Wireless/LAN Communication

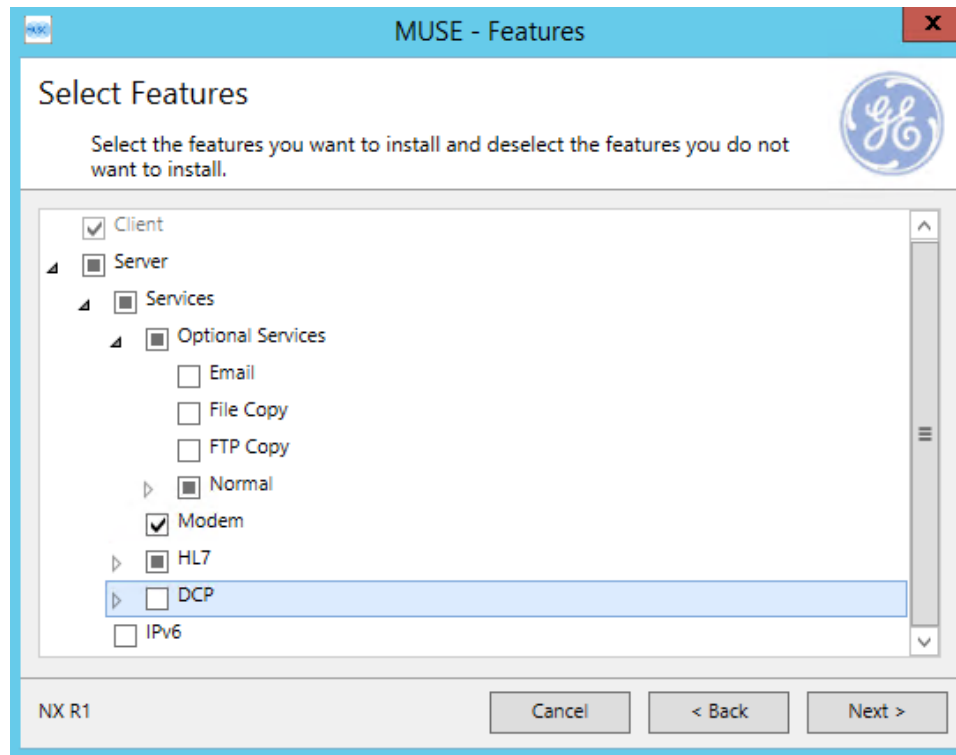
## MUSE Services

The MUSE system uses Windows services to perform certain functions within the MUSE application. MUSE services are installed and configured with the MUSE Background service account.

**NOTE:**

Before viewing or modifying the MUSE system configuration, you must safely shutdown the MUSE system to prevent user access. See ["Schedule a System Shutdown" on page 34](#).

To view a list of install options or to modify MUSE options, go to **Control Panel > Programs > Programs and Features**. Right-click on **MUSE** and select **Change**.



Some of the services have related MUSE options required to function correctly. The table below identifies the available MUSE services and any the related MUSE options. When troubleshooting specific problems, it may be useful to verify if the corresponding options are enabled.

**Table 9: MUSE Services**

<i>Service Name</i>	<i>Description</i>	<i>Default Selection</i>	<i>Related MUSE Option</i>
<b>Client</b>	This is the full MUSE system client (thick client) that permits the MUSE application server to communicate to MUSE clients.	Off	None
<b>Email</b>	Handles email transmission from MUSE.	Off	None
<b>File Copy</b>	Used by outbound folder devices in MUSE. The user account must have appropriate file system authorization to create files in specified MUSE folders device types.	Off	XML Export
<b>FTP Copy</b>	Used by outbound FTP folder devices in MUSE.	Off	XML Export

<i>Service Name</i>	<i>Description</i>	<i>Default Selection</i>	<i>Related MUSE Option</i>
<b>Normal</b>	Normal service 1-4 can be selected to normalize tests acquired into MUSE.	Off	None
<b>Modem</b>	Supports FAX and CSI wireless communication. CSI includes modem, LAN, and wireless CSI.	On	Wireless and LAN Communication. This option is not required for physical modems.
<b>XML Parser</b>	Handles acquisition of XML data.	Off	XML Import
<b>HL7 Parser</b>	Parsers 1-4 can be selected to listen for inbound HL7 messages	Off	HIS Orders Interface, HL7 ADT Query Interface
<b>HL7 Outbound</b>	Used by outbound HL7 devices in MUSE.	Off	HIS Results Interface, HL7 Batch Interface, HL7 Billing Interface, HL7 Waveform Interface
<b>DCP</b>	Listens for inbound and outbound DCP communication.	Off	None
<b>DICOM</b>	Enables communication with: <ul style="list-style-type: none"> <li>• The DICOM Modality Worklist (MWL) Service Class Provider (SCP) to retrieve orders.</li> <li>• The DICOM Storage User for outbound DICOM devices.</li> <li>• The DICOM Storage Provider for acquisition of incoming DICOM tests.</li> </ul>	Off	DICOM
<b>IPv6</b>	Adds a configuration into an XML file to support IPv6 formatted IP addresses.	Off	None

The following services are automatically installed and started:

- MUSE
- MUSE Generacq
- MUSE MT Host
- MUSE Normal 1
- MUSE Print
- MUSE Scheduler
- MUSE Format (1-4)

## 2

## System Security

For detailed information about the MUSE system security and privacy methods, see the *MUSE Cardiology Information System Privacy and Security Manual*.

The following information is additional security details and tasks specific to this version of the MUSE system.

### Security Updates

The GE Healthcare Product Security Database website lists the patches available by product to address system security.

As new vulnerabilities and potential security issues arise, GE Healthcare notifies customers of approved fixes. Time is required for GE Healthcare to identify the vulnerability, test, and validate the fix for safety and functionality. Only after this rigorous process, GE Healthcare releases the official patch. While we recognize the urgency to correct these problems, we must confirm that the integrity of the system is not compromised.

After security patches are validated for specific GE Healthcare systems, the information is added to the Product Security website. You can download the patch directly from the website of the software manufacturer (Microsoft, and so forth) and apply it to your GE Healthcare system. To check on the latest information regarding validated security patches, use the following procedure:

1. Browse the GE Healthcare Product Security website: <http://prodsecdb.gehealthcare.com>.

The **Single Sign On (SSO)** window opens.

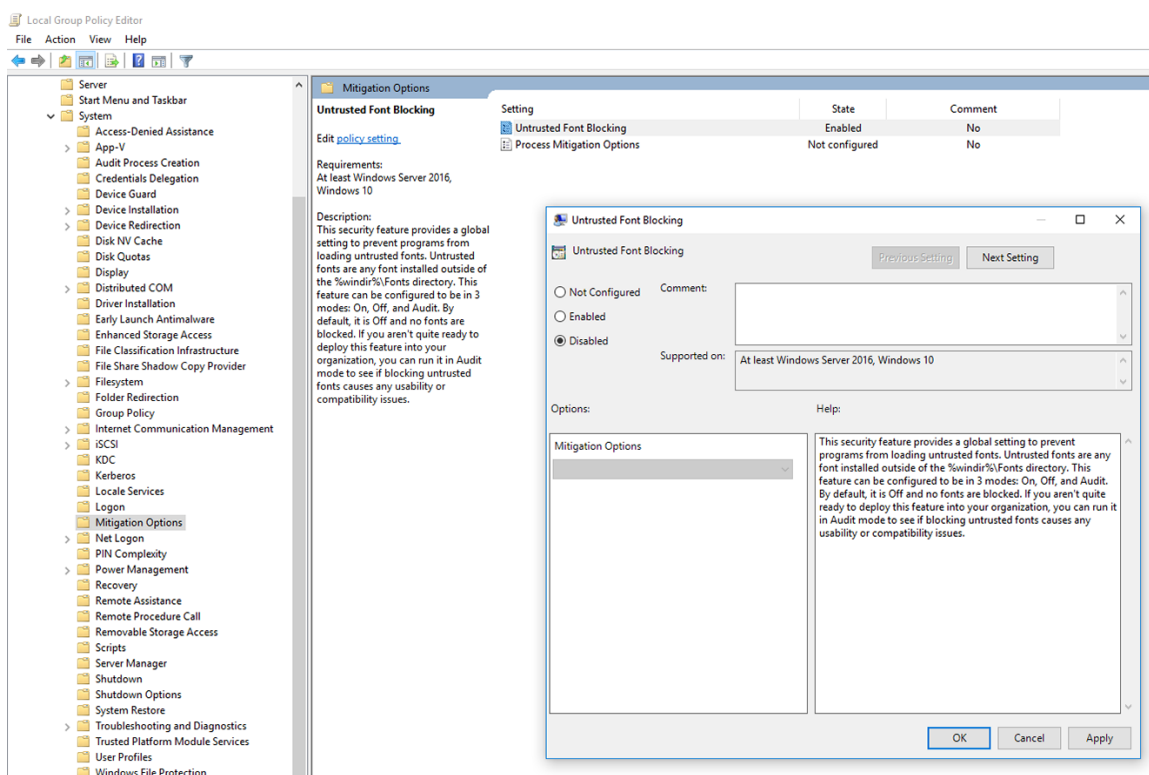
2. Enter your SSO number and password and click Log In. If you do not have an SSO number, click the **Sign Up** link to obtain one.
3. Use the features on the GE Healthcare Product Security Database website to identify security patches that you can apply to your system.



## Disable Untrusted Font Blocking

Untrusted fonts are any fonts installed outside of the **C:\Windows\Fonts** directory. A Windows 10 feature called untrusted font blocking prevents users from loading fonts processed by the Graphics Device Interface (GDI). Disable the untrusted font blocking setting to view the MUSE web client fonts and icons in your browser.

1. Open the **Local Group Policy Editor**.
  - a) Go to the **Start** menu.
  - b) In the **Search programs and files** field, enter **Edit group policy**.
2. Under the **Local Computer Policy**, go to **Computer Configuration > Administrative Templates > System > Mitigation Options**.
3. In the **Untrusted Font Blocking** setting, select **Disabled**.



4. Select **OK** to save the change.
5. Close the **Local Group Policy Editor** window.

## 3

## Service User Accounts

There are service user accounts for the MUSE system software and the SQL Server. The following information details how to manage these accounts.

### MUSE Service User Accounts

The default MUSE Administrator and MUSE Background accounts are automatically set up as users within the MUSE application. These accounts are critical to the internal working of the MUSE system and cannot be changed. The passwords and the Windows user names linked to the MUSE service user account can be changed in MUSE Modify mode or by re-installation.

**NOTE:**

User accounts may be local or linked to a domain; a combination of local and domain user accounts is not supported.

The MUSE service user accounts are linked to the Windows user service accounts through the **Windows User Name** field in the MUSE user setup. This linkage happens automatically by the MUSE installer and should only be changed by (re)installing the MUSE system or using the MUSE Modify mode. The MUSE Modify mode can be used for all servers except the web server.

**Table 10: MUSE Service User Accounts**

<i>Account</i>	<i>User Name</i>	<i>Description</i>
MUSE Administrator	<b>MuseAdmin</b>	<ul style="list-style-type: none"><li>Log on to the MUSE system to perform initial setup and configuration.</li><li>Provide ongoing service and support.</li></ul>
MUSE Background	<b>MuseBkgnd</b>	<ul style="list-style-type: none"><li>Start the MUSE-related background services on the MUSE application server and MUSE client workstations with the Modem feature.</li><li>Owner of MUSE database(s).</li><li>Linked to the SQL database <b>db_owner</b> or <b>sysadmin</b> role for all MUSE databases.</li><li>Create new MUSE site databases.</li></ul>

The MuseAdmin and MuseBkgnd user accounts in the MUSE system have known default passwords. The customer may change these passwords for these service users accounts.

## Change the MUSE Service Account Passwords in the MUSE System

To change the password of the **MUSE Administrator** or **MUSE Background** service user accounts, modify the user's password in the MUSE application.

1. Log on to the MUSE application.
2. Go to **Setup > Users**.
3. Right-click on the account you want to change and select **Properties**.  
The **User Properties** window opens.
4. Type a new password in the **MUSE Password** and **Re-enter MUSE Password** fields.
5. Select **OK** to save your change.

## Change a User Account in Windows

Change the Windows password for the active user account.

### NOTE:

If you are changing multiple accounts or a different user account than what you are logged in as, go to Windows **Edit local users and groups**. Right-click on the user account and select **Set Password**.

1. Log into Windows as **MuseAdmin** or **MuseBkgnd**.
2. Press **CTRL+ALT+Delete**.
3. Select **Change a password...**
4. Enter the old password, the new password, and then confirm the new password.
5. Press **Enter** to save your changes and log in with the new password.

## Change MUSE Service User Accounts Passwords in Windows

These instructions specify how to change the MUSE service user accounts (MuseAdmin and MuseBkgnd) in Windows. For service user account password changes in Windows, you must also change the password in the SQL Server database and the installed MUSE system configuration files.

The overview of the process is as follows:

1. Change the password in Windows.
2. Shutdown the MUSE system.
3. Modify the installed MUSE system configuration.
4. Cancel the MUSE system shutdown.

After you change a MUSE service user account, verify the username and role for the SQL Server.

## Verify SQL Server Logins and Roles for MUSE Administrator and MUSE Background Users

### NOTE:

If only the Windows user passwords are changing, disregard this section.

The hospital MUSE and IT administrators must ensure the MUSE Service Users have appropriate SQL Server Logins and Roles. Confirm that the user accounts in MUSE system meet the requirements specified in ["SQL Server Role Requirements"](#).

## Shut Down the MUSE Services

Follow these steps to shut down the MUSE services.

1. Log on to the MUSE application server as the MUSE Administrator.
2. Perform a full shutdown of the MUSE system using the instructions in ["Schedule a System Shutdown" on page 34](#).

Notify all users that the system is being shut down for maintenance.

## Update the MUSE Service Account Configuration

After changing the MUSE service user accounts in Windows, the installed MUSE configuration needs to be modified with the new accounts information.

Perform the following steps on the MUSE application server and any MUSE client or modem servers that have the MUSE Modem feature installed.

1. Log on to Windows as local administrator (for a MUSE client workstation) or as **MuseAdmin** for the MUSE application server.
2. Confirm that the MUSE application services have stopped.
3. Go to **Control Panel > Programs > Programs and Features**.
4. Select **MUSE** and select **Change**.  
The **Welcome to the MUSE Setup Wizard** window opens.
5. Select **Next** for each window until the **MUSE Services Configuration** window opens.

6. Type the user name and password for the **MUSE Background** account and the user name for the **MUSE Administrator** account.

**NOTE:**

The MUSE Administrator **User Name** field is not present when modifying the MUSE configuration on a MUSE client.

- If you are using a domain account, type the user name in **<domain name> \<user name>** format.
- If you are using a local account, type the user name in **.\<user name>** format.

No password is required for the MUSE Administrator user account.

7. Select **Next**.

The configured user accounts are validated as existing on the system. If you receive a warning message that the account was not found or user validation failed, select **No** to return to the **Services Configuration** window and check the following:

- The user name for the accounts and the password are correct.
- The accounts exist in the MUSE system and in Windows.

8. Select **Next** at each window until the **Maintenance Complete** window opens.
9. Select **Finish**.

## Cancel the Auto Shutdown

1. Cancel the MUSE shutdown using the instructions in ["Cancel the System Shutdown" on page 35](#).
2. Verify if that all MUSE services have started.

## SQL Server Roles

The following table provides SQL Server role requirements for the MUSE Administrator and MUSE Background user accounts when logging into the SQL server instance where the MUSE databases are located.

**Table 11: SQL Server Role Requirements**

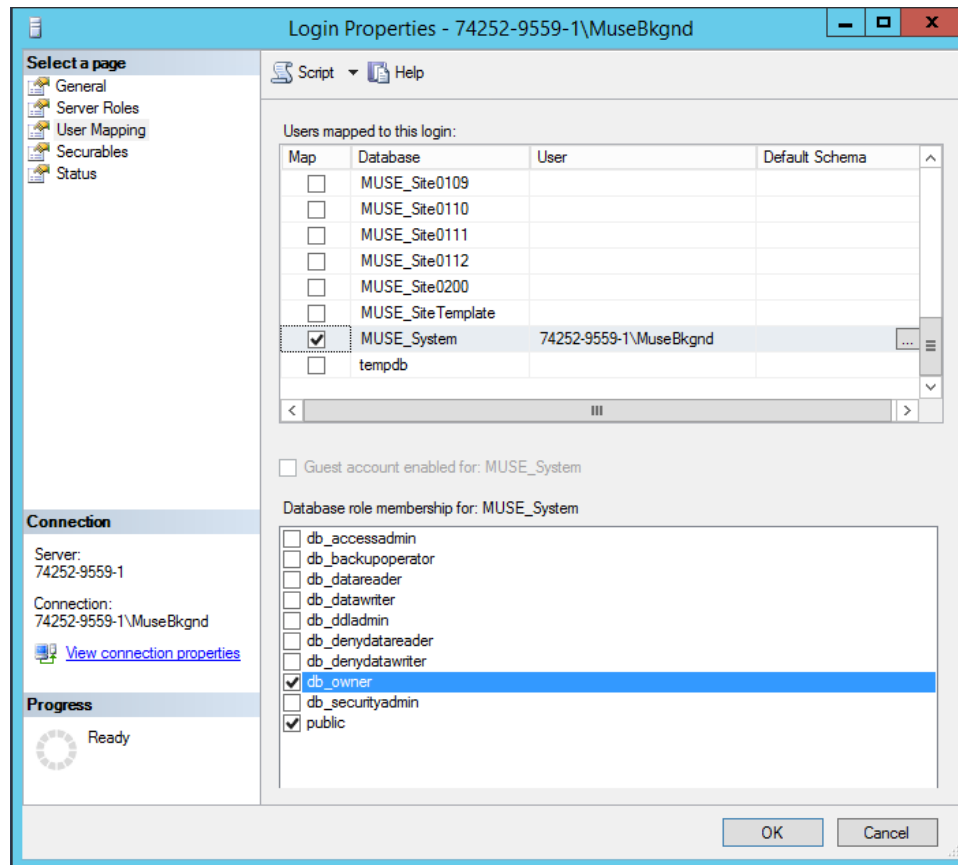
<i>Account</i>	<i>Preferred for Local Database</i>	<i>Preferred for Remote Database</i>
MUSE Administrator	SQL Server Login with the <b>sysadmin server role</b> on the SQL Server instance where the MUSE databases are located.	SQL Server Login with the <b>public server role</b> on the SQL Server instance where the MUSE databases are located and database user with <b>db_owner database role</b> for all of the MUSE databases.
MUSE Background	SQL Server Login with the <b>sysadmin server role</b> on the SQL Server instance where the MUSE databases are located.	SQL Server Login with the <b>dbcreator server role</b> on the SQL Server instance where the MUSE databases are created and database user with <b>db_owner database role</b> for all of the MUSE databases.

**NOTE:**

It is not possible to give **db\_owner database role** access to the MUSE Administrator or MUSE Background account until the MUSE databases are created. When the MUSE database is installed or upgraded, the MUSE installer automatically attempts to set the database owner and **dbcreator server role** to the MUSE Background account specified during the installation wizard.

## Assign db\_owner Role to Existing SQL Server Logins

1. Using **SQL Server Management Studio**, log on to the appropriate SQL Server instance with the **MuseBkgnd** service user account.
2. In **Object Explorer**, expand the database server.
3. Go to **Security > Logins**.
4. Right-click on the login you want to assign the **db\_owner** role and choose **Properties**.



5. Select the **User Mapping** page.
6. In the **Users mapped to this login** section of the window, select **MUSE\_System**.
7. In the **Database role membership for: MUSE\_System** section of the window, select **db\_owner**.
8. Repeat Steps "6" and "7" for each of the remaining MUSE databases (for example, update site databases like **MUSE\_SiteTemplate**, **MUSE\_Site0002**, **MUSE\_Site0003**, and so on.).
9. Select **OK**.
10. Exit **SQL Server Management Studio**.

## Assign SQL Server Roles to a Login

1. Using SQL Server Management Studio, log on to the appropriate SQL Server instance using a SQL Server login with **sysadmin server role** access.
2. In **Object Explorer**, expand the database server.
3. Navigate to and expand **Security > Logins**.

4. Right-click on the login you want to assign the SQL Server roles to and select **Properties**.
5. Select the **Server Roles** page.
6. Select the server roles you want to assign to the SQL Server login.

**NOTE:**

The **public server** role is always selected and cannot be cleared.

7. Select **OK**.

## Create a SQL Server Login

A SQL server login is required for all users that need access to the SQL Server instance.

1. Using SQL Server Management Studio, log on to the appropriate SQL Server instance using a SQL Server login with **sysadmin server role** access.
2. In Object Explorer, expand the database server.
3. Right-click **Security** and go to **New > Login....**
4. Make sure the **General** page is selected.
5. Select **Windows Authentication**.
6. In the **Login name** field, type the Windows username **<domain>\<username>** in format of the Windows user to create the SQL Server login.

You can also use **Search...** to locate the user you want to add.

7. Select **OK**.



# 4

## System Shutdown Procedures

The MUSE Shutdown System feature notifies users currently logged on to the MUSE system up to five minutes in advance that the MUSE system is shutting down.

To activate this feature, MUSE system users must have the **Shutdown** privilege enabled for their role. Roles that have this privilege by default include:

- MUSE service user accounts
- System owner
- Site manager

There are two types of shutdown:

- **Full Shutdown**
  - Shuts down all MUSE services on the MUSE application server and MUSE clients.
  - The MUSE application cannot launch from the MUSE client or the MUSE application server.
  - MUSE Web API does not function, including the MUSE Web UI.
- **Partial Shutdown**
  - Shuts down MUSE client applications running remotely.
  - The MUSE services on the MUSE application server continue to run.
  - MUSE application only can be launched from the MUSE application server.
  - MUSE Web API does not function, including the MUSE Web UI.

**NOTE:**

Initiating a Full or Partial Shutdown requires that the shutdown be canceled. If the MUSE service is restarted or the MUSE system is rebooted, only the MUSE and MUSE MT Host service starts until the shutdown is canceled. For information on how to cancel the shutdown, see ["Cancel the System Shutdown" on page 35](#).

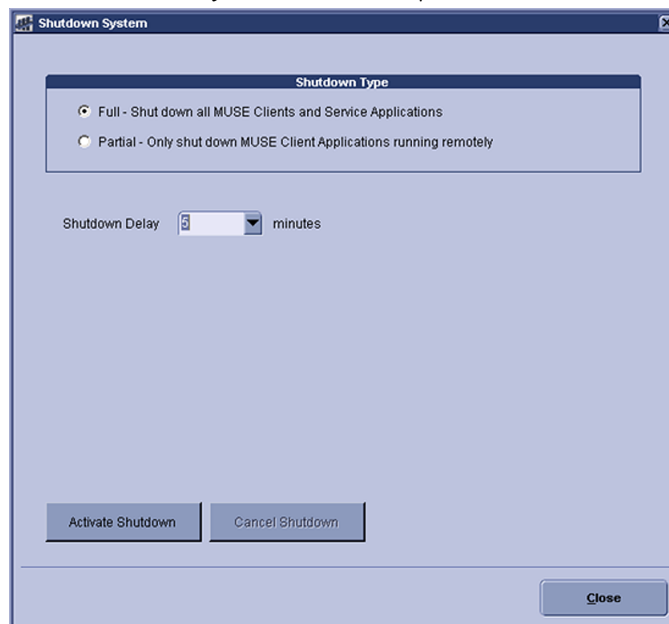
## Shutdown the MUSE Application Server or Database

Before shutting down the server, notify all users of the scheduled shutdown. These steps apply to the MUSE application server and the MUSE database.

1. *"Schedule a system shutdown."*
2. After the MUSE application is shut down, shut down the MUSE application server following normal Windows shutdown procedures.
3. Restart the MUSE application server.
4. *"Cancel the system shutdown."*

### Schedule a System Shutdown

1. Log on to the MUSE application server as an administrator.
2. In the MUSE application, go to **System > Setup**.
3. In the **Setup** window, select **System**.
4. Right-click on the **Product name** and select **Shutdown System**.  
The **Shutdown System** window opens.



5. Select the **Shutdown Type**.
  - Select **Full** to close the MUSE client application and stop MUSE services.
  - Select **Partial** to disconnect all remote connections to the MUSE clients. The MUSE clients and the MUSE services continue to run.

#### NOTE:

If the MUSE application stays open on a remote client workstation, the application disconnects from the MUSE server.

6. Select the time for the **Shutdown Delay**.
7. Select **Activate Shutdown**.

The top of the MUSE client application shows when the shutdown occurs.



## Cancel the System Shutdown

1. Go to **Services**.
2. Right-click on the **MUSE** service and select **Start**.  
This starts the MUSE MT host service and allows you to log on.
3. Log on to the MUSE application on the MUSE application server.  
The application displays the current shutdown status at the top of the window.



4. In the MUSE application, go to **System > Setup**.
5. Select **System**.
6. Right-click on the **Product name** and select **Shutdown System**.
7. In the **Shutdown System** window, select **Cancel Shutdown**.  
If the MUSE services were stopped, they are now restarted and remote connectivity is restored.  
The system does not automatically notify users that the MUSE system is available.

## Shutdown the MUSE HL7 Interface (CCG)

1. Temporarily shut down CCG inbound interfaces (ADT and Orders).
  - a) From the Windows desktop, open **IDE interface** and stop the threads and processes for any active Cloverleaf sites (usually **muse\_prod** and **his\_prod**).
  - b) Stop the **Infor Cloverleaf(R) Integration Services 60** service.
2. Shut down the system following the normal Windows shutdown procedures. This will terminate all services and shut down CCG completely.

## Shutdown the MUSE Client

1. Close all patient tests.
2. Close all browser windows and applications.
3. Shut down the system following normal Windows shutdown procedures.

# 5

## Advanced MUSE System Configuration

These topics share advanced information to manage and alter the existing MUSE system configuration.

For general instructions on how to setup and configure the MUSE system, see the *MUSE Cardiology Information System Administrator Manual*. The *MUSE Cardiology Information System Administrator Manual* details how to configure the MUSE web client, client workstation, and provides additional reference material for shortcuts, privileges, and system codes.

**THIS TEXT SHOULD ONLY SHOW FOR VERSION R2.**

### Modify the MUSE Installed Configuration

With the MUSE Installer, you can view or change the installed configuration for the MUSE system. This is sometimes referred to as MUSE Modify mode. You access the installed MUSE configuration to:

- View installed options
  - Add a newly purchased option
  - Add a service required for a new option
  - Add a feature
  - Change server details
  - Change the MUSE port number
  - Change the Windows accounts and passwords
1. Log on to the system as MUSE administrator.
  2. ["Schedule a system shutdown"](#) or notify users that the system is being shut down for maintenance.
  3. If open, close the MUSE client application.
  4. Go to **Control Panel > Programs > Programs and Features**.

5. Right-click on **MUSE** and select **Change**.
6. On the **Welcome to the MUSE Setup Wizard** window, select **Next >**.
7. Go to the correct MUSE Installer screen to verify, add, or modify the MUSE system configuration.

Select **Next** to bypass any screen without making changes.

Select **Cancel** at any point to not save your changes and exit the installer.

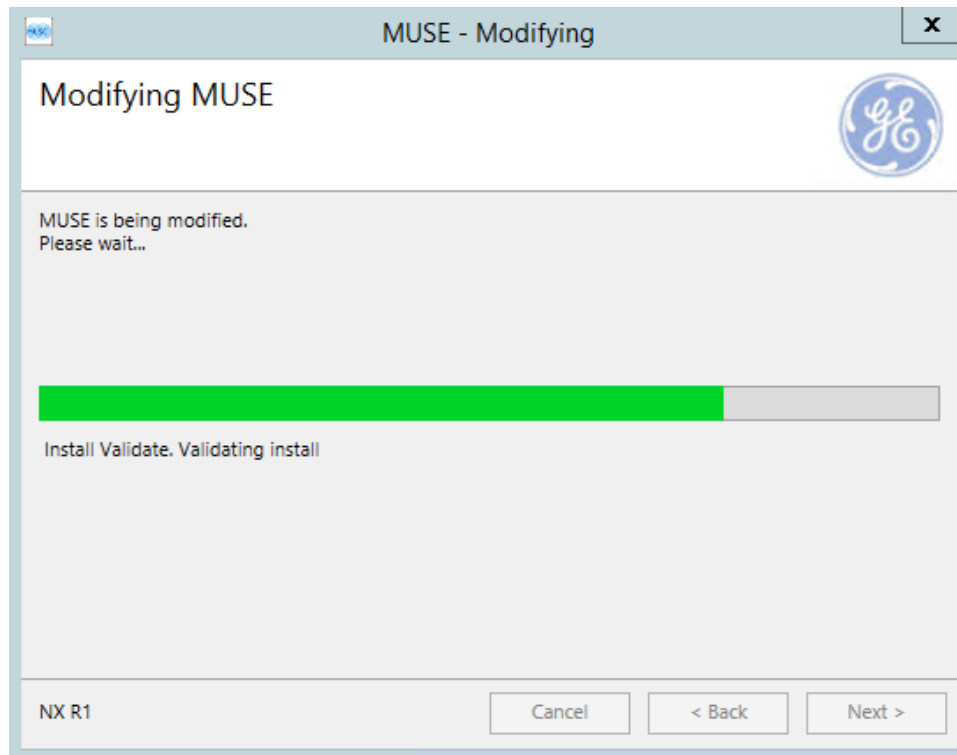
<i>MUSE Installer Screen</i>	<i>View or change the...</i>
<b>MUSE Server Details</b>	<ul style="list-style-type: none"> <li>• MUSE server name</li> <li>• MUSE server port number</li> <li>• Language</li> <li>• Authentication shortcut/method</li> </ul>
<b>Select Database Server</b>	MUSE database server
<b>Select Options</b>	MUSE options
<b>Select Features</b>	MUSE services/features

8. On the **MUSE Services Configuration** screen, enter the **Background User Password**.
9. Select **Next >**.
10. Enter the **Options Configuration Password**. The **Serial Number** should be pre-populated. If you need to manually enter the serial number, refer to your *Product Activation Sheet*. Then, select **Next >**.

**NOTE:**

Only a qualified GE Healthcare service representative has access to the Options Configuration Password. This password cannot be provided to customers.

11. Select **Next >**.
12. Select **Next >** to confirm installation with the modified settings. The **Modifying MUSE** screen displays installation progress.



13. On the **Modify Complete** screen, select **Close**.
14. *"Cancel the system shutdown."*

## Rename the MUSE Application Server

If the computer name of the MUSE application server needs to be changed after installation of the MUSE software, use the following procedure to change the computer name. When you rename the MUSE file server, you may require the assistance and cooperation of the local IT department.

Renaming the MUSE application server consists of the following steps:

- Shut down the MUSE system
- Rename the MUSE application server
- Update the SQL Server configuration (local databases only)
- Update the MUSE configuration
- Cancel the system shutdown

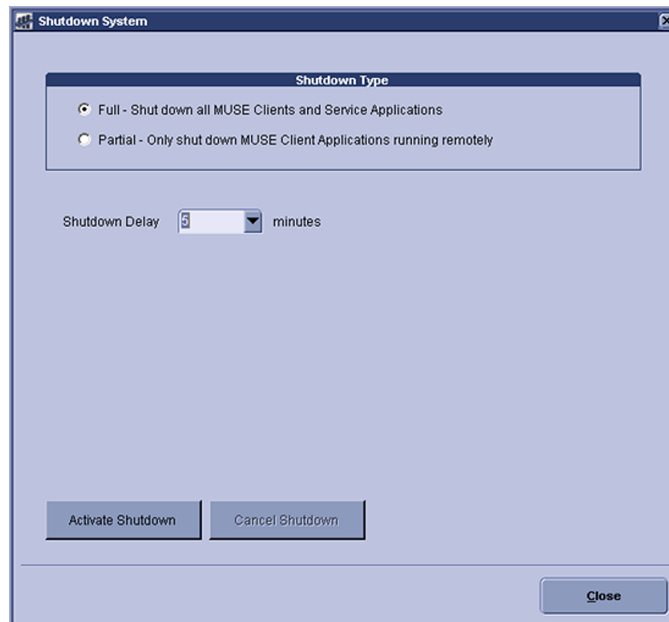
Review the following conditions before you rename the MUSE application server:

- If any systems (such as CASE) access the MUSE application by name, those systems need to be updated with the new name.
- If the MUSE application server is hosting any MUSE modems or printers, the computer name for the device in the MUSE system must be updated with the new name.

## Schedule a System Shutdown

1. Log on to the MUSE application server as an administrator.
2. In the MUSE application, go to **System > Setup**.
3. In the **Setup** window, select **System**.
4. Right-click on the **Product name** and select **Shutdown System**.

The **Shutdown System** window opens.



5. Select the **Shutdown Type**.
  - Select **Full** to close the MUSE client application and stop MUSE services.
  - Select **Partial** to disconnect all remote connections to the MUSE clients. The MUSE clients and the MUSE services continue to run.

**NOTE:**

If the MUSE application stays open on a remote client workstation, the application disconnects from the MUSE server.

6. Select the time for the **Shutdown Delay**.
7. Select **Activate Shutdown**.  
The top of the MUSE client application shows when the shutdown occurs.



## Change the SQL Server Name for a Local Database Server

Update the SQL Server configuration if the database is local to the MUSE application server. If the SQL Server database is remote, see ["Update the MUSE Configuration" on page 40](#).

1. Log on to the MUSE application server as a Windows user with sysadmin server role on the SQL Server.
2. Open **SQL Server Management Studio** and connect to the server using the new computer name.
3. Create and execute the following query:

```
--- BEGIN QUERY ---
EXEC SP_DROPSEVER 'OldSQLServerName\ServerInstance'
EXEC SP_ADDSERVER 'NewSQLServerName\ServerInstance',
    local
--- END QUERY---
```

Where *OldSQLServerName\ServerInstance* is the old server name and instance and *NewSQLServerName\ServerInstance* is the new server name and instance.

4. Verify the message, **Command(s) completed successfully**, opens in the **Messages** tab.
5. Close **SQL Server Management Studio**.
6. Restart the SQL Server service (MSSQLSERVER).
7. Open **SQL Server Management Studio** and connect to the server using the new computer name.
8. Create and execute the following query:

```
--- BEGIN QUERY ---
SELECT @@SERVERNAME as 'NewServerName\SQLInstance';
--- END QUERY---
```

Where *NewServerName\SQLInstance* is the new server name and instance.

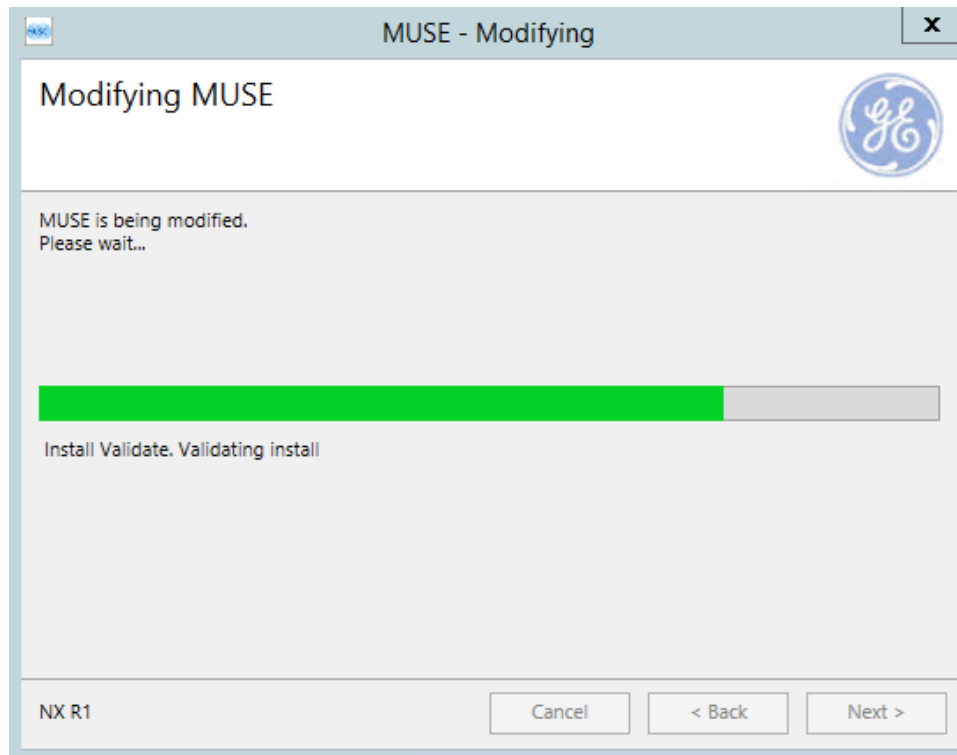
9. Verify that the **Results** tab shows the new computer name as the value for **Server Name**.
10. Close **SQL Server Management Studio**.

## Update the MUSE Configuration

1. Log on to as the MUSE administrator (for the MUSE application server) or as the local administrator (for the MUSE client workstation).



2. Go to **Control Panel > Programs > Programs and Features**.
3. Right-click on **MUSE** and select **Change**.
4. On the **Welcome to the MUSE Setup Wizard** window, select **Next >**.
5. Select **Next >** to bypass the **MUSE Server Details**.
6. On the **Select Database Server** screen, select from the drop-down menu or type the name of the SQL Server for the MUSE database.  
 You must specify the SQL Server by name, not by the IP address. If a non-default SQL Server instance will be used, include the instance name.  
 Default instance example: **SQLSERVER**  
 Named instance example: **SQLSERVER\INSTANCE**.
7. Select **Next**.  
 The installer validates that the database is available. If the database cannot be found, the following message box opens: **Database not found, please manually verify that the database server is correct. Once the database server is available the MUSE Services installed on this box must be restarted. Do you want to continue?** Select **No**.  
 Verify the name and instance of the SQL Server before proceeding. If the database validation is successful, the **Select Options** screen displays.
8. Select **Next >** until you get to the **MUSE Services Configuration** screen.
9. On the **MUSE Services Configuration** screen, enter the **Background User Password**.
10. Select **Next >**.
11. Enter the **Options Configuration Password**. The **Serial Number** should be pre-populated. If you need to manually enter the serial number, refer to your *Product Activation Sheet*. Then, select **Next >**.  
**NOTE:**  
 Only a qualified GE Healthcare service representative has access to the Options Configuration Password. This password cannot be provided to customers.
12. Select **Next >**.
13. Select **Next >** to confirm installation with the modified settings. The **Modifying MUSE** screen displays installation progress.



14. On the **Modify Complete** screen, select **Close**.

After renaming the server, the MUSE installed configuration needs to be modified to point to the new application server.

## Change the SQL Server Name for a Remote Database Server

Update the SQL Server configuration if the database is separate (remote) from the MUSE application server. If the SQL Server database is local, see ["Change the SQL Server Name for a Local Database Server" on page 40](#).

## Update the MUSE Database Server Configuration

After moving MUSE databases, the MUSE installed configuration needs to be modified to point to the new database server. Perform the following steps on the MUSE application server and any MUSE client or modem servers that have the MUSE Modem feature installed:

1. Log on as an administrator to either the MUSE application server or the client workstation.
2. Go to **Control Panel > Programs > Programs and Features**.
3. Right-click on **MUSE** and select **Change**.
4. On the **Welcome to the MUSE Setup Wizard** window, select **Next >**.
5. Select **Next >** to bypass the **MUSE Server Details**.

6. On the **Select Database Server** screen, enter the database server name or use the drop-down menu to select the correct database server.

You must specify the SQL Server by database server name, not by the IP address. If a non-default SQL Server instance will be used, include the instance name.

Default instance example: **SQLSERVER**.

Named instance example: **SQLSERVER\INSTANCE**.

7. Select **Next**.

The installer validates that the database is available. If the database cannot be found, the following message box opens: **Database not found, please manually verify that the database server is correct. Once the database server is available the MUSE Services installed on this box must be restarted. Do you want to continue?** Select **No**.

Verify the name and instance of the SQL Server before proceeding. If the database validation is successful, the next screen, **MUSE Select Options**, displays.

8. Select **Next >** until you get to the **MUSE Services Configuration** screen.

9. On the **MUSE Services Configuration** screen, enter the **Background User Password**.

10. Select **Next >**.

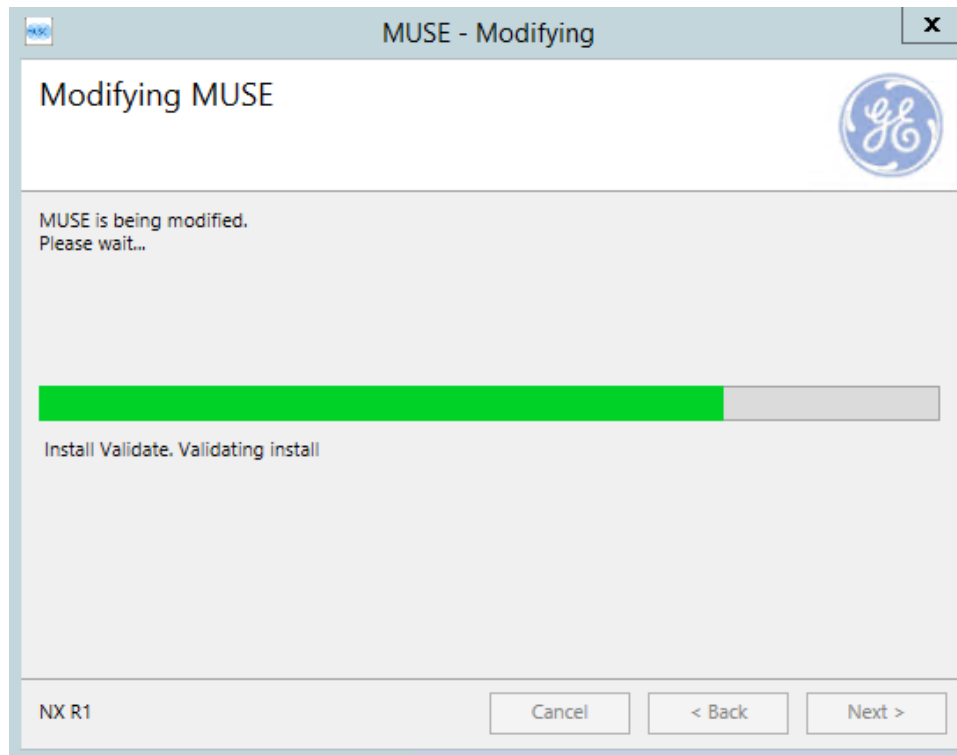
11. Enter the **Options Configuration Password**. The **Serial Number** should be pre-populated. If you need to manually enter the serial number, refer to your *Product Activation Sheet*. Then, select **Next >**.

**NOTE:**

Only a qualified GE Healthcare service representative has access to the Options Configuration Password. This password cannot be provided to customers.

12. Select **Next >**.

13. Select **Next >** to confirm installation with the modified settings. The **Modifying MUSE** screen displays installation progress.



14. On the **Modify Complete** screen, select **Close**.

### Update the Local SQL Server Administrator Accounts

1. Open the **SQL Server Management Studio** and connect to the server using the new computer name: **MUSENXSERVER**.
2. Select **Security > Logins**.
3. Right-click on each local MUSE administrator user account (MuseAdmin, MuseBkgnd, and MuseUser) and select **Rename**.
4. Rename the **Login** name with the new computer name: **MUSENXSERVER**.
5. Select **OK** to save and close the window.

### Cancel the System Shutdown

1. Go to **Services**.
2. Right-click on the **MUSE** service and select **Start**.  
This starts the MUSE MT host service and allows you to log on.
3. Log on to the MUSE application on the MUSE application server.  
The application displays the current shutdown status at the top of the window.



4. In the MUSE application, go to **System > Setup**.
5. Select **System**.
6. Right-click on the **Product name** and select **Shutdown System**.
7. In the **Shutdown System** window, select **Cancel Shutdown**.

If the MUSE services were stopped, they are now restarted and remote connectivity is restored.

The system does not automatically notify users that the MUSE system is available.

## Install MUSE with a Non-Standard Port Number

Use these steps to use a port number other than the default 8001 and 8002.

1. Install the MUSE application server with a non-standard port number.
  - a) From a command prompt, change the directory to the **MUSE Application** folder on the install media.
  - b) Type **MuseSetup.exe ServerPort=<new\_port>** to run the MUSE Installer with the desired port set.
  - c) Complete the MUSE Installer process.
2. Install the MUSE workstation with a non-standard port number. These steps need to be completed on each MUSE workstation.
  - a) From a command prompt, change the directory to the **MUSE Application** folder on the install media.
  - b) Type **MuseSetup.exe ServerPort=<new\_port>** to run the MUSE Installer with the desired port set.
  - c) Complete the MUSE Installer process.
3. Install the MUSE Web API with a non-standard port number.
  - a) Open the command prompt with **Run as Administrator** and change the directory to the **MUSE Web API** folder on the install media.
  - b) Type **MuseWebApi.exe MuseServerPort=<new\_port>** to run the MUSE Web API Installer with the desired port set.
  - c) Complete the MUSE Installer process for the MUSE Web API.

## Change the MUSE Port Number

The port number for the MUSE system is set during initial installation and you should not need to change it.

If a port number needs to be changed, it must be changed for the MUSE application server and the MUSE Web API. The port number on all MUSE clients must match the port number set on the server.

**NOTE:**

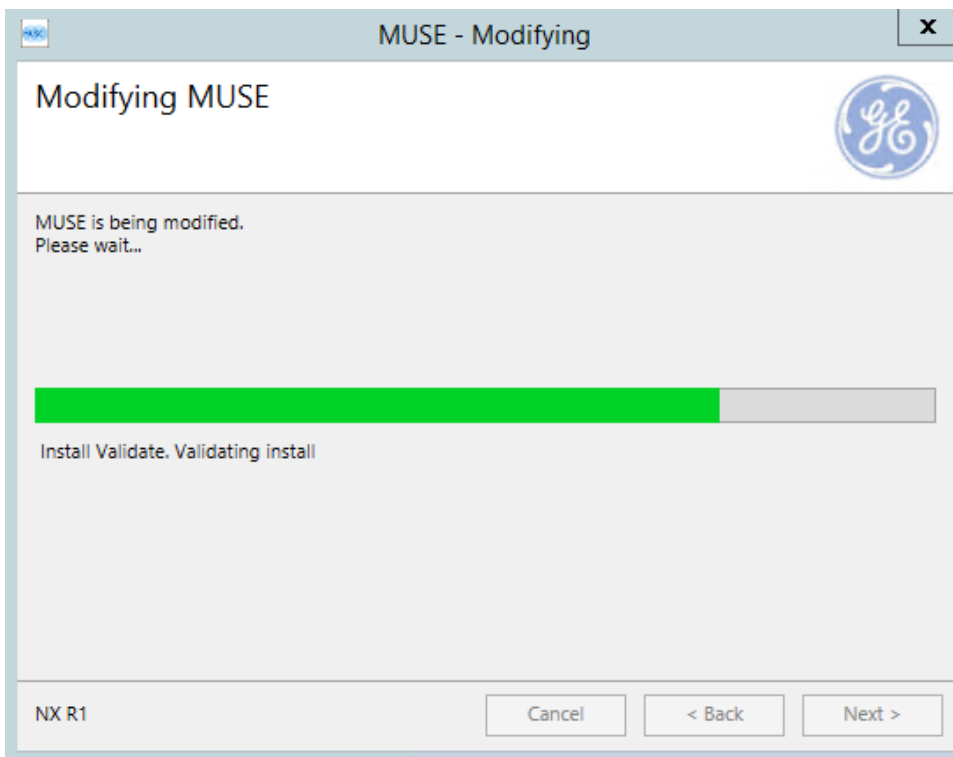
Changing the port number causes all MUSE services to restart. Schedule a system shutdown to notify users to log out for a MUSE system change.

1. Log on to the MUSE application server as MUSE Administrator.
2. *"Schedule a system shutdown."*
3. From a command prompt, change the directory to the **MUSE Application** folder on the install media.
4. Type **MuseSetup.exe ServerPort=<new\_port>**. Enter the new port number based on your system configuration.

For example, to change the MUSE server to use port numbers 5678 and 5679, enter:

```
MuseSetup.exe ServerPort=5678
```

5. The MUSE Installer displays in Modify Mode. Update the port number in the Installer wizard.
6. Select **Next >** until you get to the **MUSE Services Configuration** screen.
7. On the **MUSE Services Configuration** screen, enter the **Background User Password**.
8. Select **Next >** to confirm installation with the modified settings. The **Modifying MUSE** screen displays installation progress.



9. On the **Modify Complete** screen, select **Close**.
10. Repeat these steps for each MUSE workstation installation.
11. To change the port number of the MUSE Web API to the same port number of the MUSE application server, uninstall the MUSE Web UI and then uninstall the MUSE Web API.
12. Open the command prompt with **Run as Administrator** and change the directory to the **MUSE Web API** folder on the install media.
13. Type **MuseWebApi.exe MuseServerPort=<new\_port>**. Enter the same port number as the MUSE application server.  
For example, to install the MUSE Web API with port number 5678 and 5679:

```
MuseWebApi.exe MuseServerPort=5678
```

14. Reinstall the MUSE Web API to update the application server port number.
  - a) Go to the MUSE application directory. Open the **MuseWebApi** folder and select **MuseWebApi**.
  - b) Follow the MUSE Installer for the MUSE Web API to complete installation.
15. Reinstall the MUSE Web UI.
  - a) Go to the MUSE application directory. Open the **MuseWebUI** folder and select **MuseWebUI**.

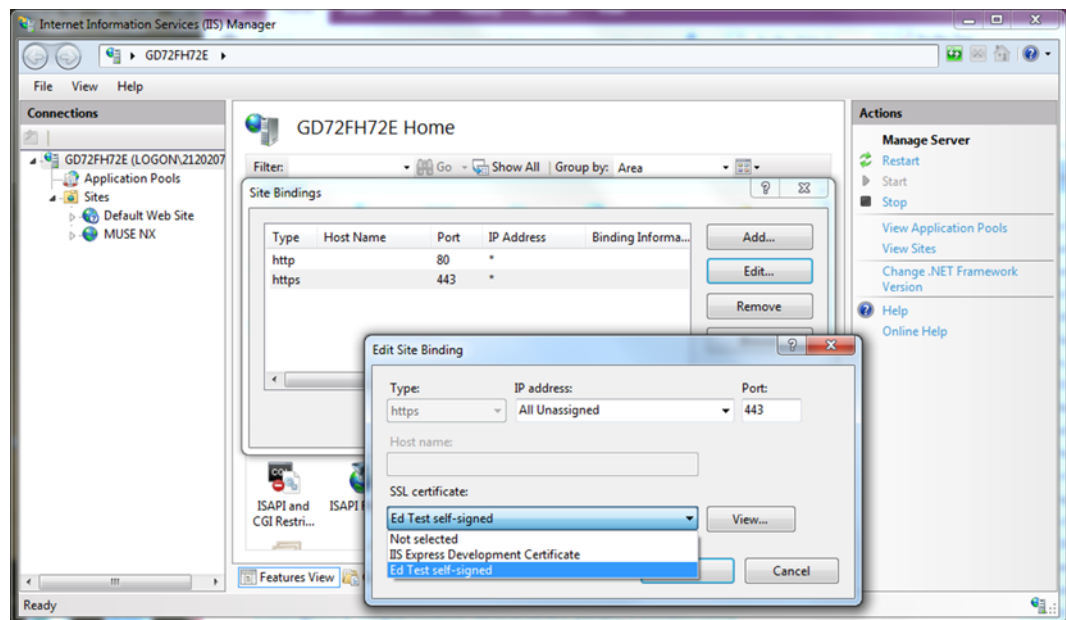
b) Follow the MUSE Installer for the MUSE Web UI to complete installation.

16. *"Cancel the system shutdown."*

## Update the Certificate Binding (Not for New Installations)

A certificate binding tells a web URL how to connect to a website using the IP address, port number, and SSL certificate for authentication. If the certificate needs to be updated outside of the MUSE Installer (in MUSE Modify Mode), the certificate binding also needs to be updated.

1. In Windows, open the **Internet Information Services (IIS) Manager**.
2. Right-click on the website and select **Edit bindings...**
3. In the **Site Bindings** window, select **https** and select **Edit**.
4. In the **Edit Site Binding** window, select the correct **SSL certificate**.



5. Select **OK** and close the IIS Manager.
6. Verify that the certificating binding has been updated by opening the MUSE web client. If you are able to access the site, the certificate binding was correctly updated.

## Install IIS if Not Installed by Default

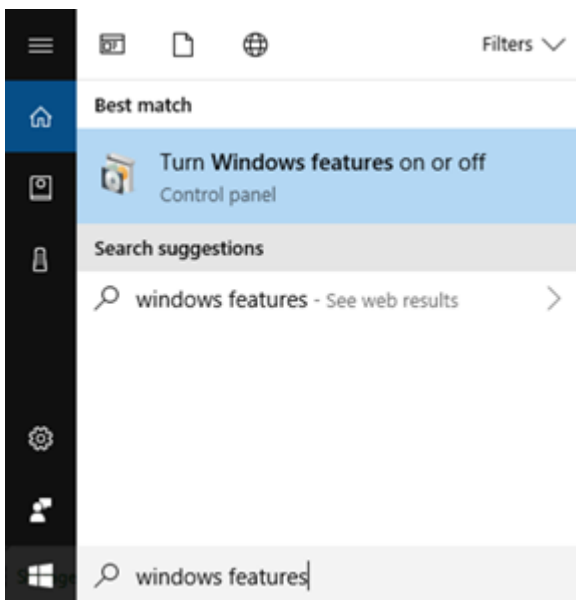
The Internet Information Services (IIS) Manager is Microsoft's web server management tool. Typically, the tool is enabled by default. If the tool is not automatically enabled, you need to manually enable the tool through Windows features.



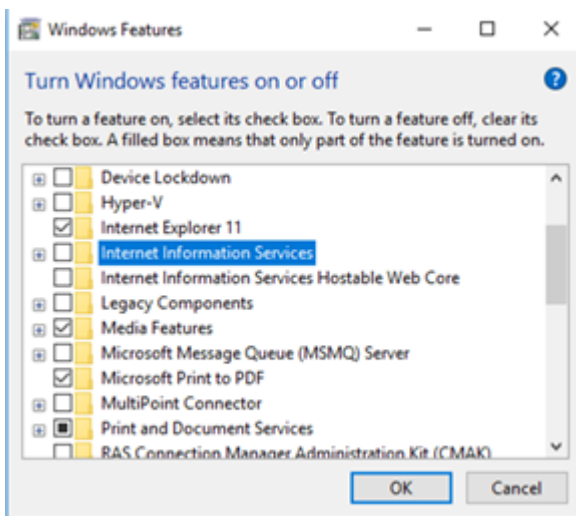
**NOTE:**

These steps are for the Windows 10 operating system. The steps may have to be slightly adjusted for other operating system versions.

1. In the Windows search bar, type **Windows Features** and select **Turn Windows features on or off**.



2. In the **Windows Features** window, check the box for **Internet Information Services** to enable the IIS tool.



3. Select **OK**. The IIS tool installs. This may take some time.
4. Select **Close**.
5. Go to **Control Panel > Administrator Tools** and verify that the IIS Manager is present on your system.

## Configure Windows High Contrast Color Scheme on MUSE Client

Enable **Windows High Contrast Color Scheme** of MUSE system for users with color vision deficiency (color blindness) as per the below steps.

**NOTE:**

Inform color impaired system users to use the shortcuts with **Windows Default Colors** appended to the end of the name.

Inform system users who are not color impaired to use the original shortcuts.

- At the MUSE client, use **Windows Display > Appearance** settings to activate one of the High Contrast options:
  - High Contrast #1
  - High Contrast #2
  - High Contrast Black
  - High Contrast White
- From the Windows desktop, copy a MUSE shortcut icon, created during installation, and paste it on the Windows desktop.
- Rename the shortcut by adding **Windows Default Colors** to the end of the name.
- Right-click on the shortcut and select **Properties**.
- In the **Target** field, add **<space> —nocui** to the end of the string.
- Click **OK** to save the changes.
- Repeat steps "2" through "6" for each of the MUSE shortcut icons.

## Change the Default Rhythm Lead(s) in ECG Format Settings

The ECG Format Settings within the MUSE application can be configured to output rhythm leads. For example, the default rhythm leads can be configured in the **ECG Specific Format Properties > Format Styles** screen of the MUSE system.

<i>Format Style</i>	<i>Default Rhythm Lead(s)</i>
4 x 2.5 with 1 Rhythm Lead	V1
4 x 2.5 with 3 Rhythm Leads	V1, II, V5
Pharma 4 x 2.5 with 2 Rhythm Leads	V1, II
Pediatric 5 x 2 with 1 Rhythm Lead	V1

<i>Format Style</i>	<i>Default Rhythm Lead(s)</i>
Adult 5 x 2 with 1 Rhythm Lead	V1

The default rhythm leads for one or all ECG format settings can be changed. Two tools installed during installation help to change and install the default rhythm leads in the MUSE application folder **C:\Program Files (x86)\MUSE**.

<i>Tool</i>	<i>Description</i>
<b>setlead1.bat</b>	Changes the first default rhythm lead. For use by format styles with 1 rhythm lead only.
<b>setlead3.bat</b>	Changes all three default rhythm leads. For use by format styles with 2 or 3 rhythm leads.

To execute this command-line tool, perform the following steps:

1. Log on to the MUSE application server as the MUSE Administrator.
2. Launch the Windows **Command Prompt**.
3. Change to the location of the MUSE application folder.
4. Execute either **setlead1.bat** or **setlead3.bat** with appropriate command-line parameters specified in ["setlead1.bat Tool" on page 51](#) or ["setlead3.bat Tool" on page 52](#).

## setlead1.bat Tool

The following tables list the command string to use the tool along with examples and description.

Usage	<b>setlead1 lead1 [-id:&lt;format&gt;] [-server:&lt;server&gt;] [-prefix:&lt;prefix&gt;]</b> where: <b>lead1</b> = I, II, V1, V2, V3, V4, V5, V6, III, AVR, AVL, AVF <b>-id</b> = Format ID (default=all) <b>-server</b> = Name of SQL server and instance <b>-prefix</b> = Prefix for MUSE database
-------	--

<i>Command/Usage Example</i>	<i>Description/Result</i>
<b>setlead1 II</b>	Database server is local. Sets the default rhythm lead for all ECG format settings to II.
<b>setlead1 II -id:6</b>	Database server is local. Sets the default rhythm lead for format setting with ID 6 to II.
<b>setlead1 II -id:6 -server:SQLMAIN1</b>	Database server is named <b>SQLMAIN1</b> . Sets the default rhythm lead for format setting with ID 6 to II.

## setlead3.bat Tool

The following tables list the command string to use the tool along with examples and description.

Usage:	<b>setlead3 lead1 lead2 lead3 [-id:&lt;format&gt;] [-server:&lt;server&gt;] [-prefix:&lt;prefix&gt;]</b> where: <b>lead1</b> = I, II, V1, V2, V3, V4, V5, V6, III, AVR, AVL, AVF <b>lead2</b> = I, II, V1, V2, V3, V4, V5, V6, III, AVR, AVL, AVF <b>lead3</b> = I, II, V1, V2, V3, V4, V5, V6, III, AVR, AVL, AVF <b>-id</b> = Format ID (default=all) <b>-server</b> = Name of SQL server and instance <b>-prefix</b> = Prefix for MUSE database
--------	--

Command/Usage Example	Description/Result
<b>setlead3 V1 V2 V3</b>	Database server is local. Sets the default rhythm leads for all ECG format settings to V1, V2, and V3.
<b>setlead3 V1 V2 V3 -id:6</b>	Database server is local. Sets the default rhythm lead for format setting with ID 6 to V1, V2, and V3.
<b>setlead3 V1 V2 V3 -id:6 -server:SQLMAIN1</b>	Database server is named <b>SQLMAIN1</b> . Sets the default rhythm lead for format setting with ID 6 to V1, V2, and V3.

## Import and Export Profiles Tool

The MUSE system has a tool to import and export MUSE profiles from one system to another. This is useful when transferring profiles from a test system to a production system or during a system upgrade.

### Launch the Import and Export Profiles Tool

To launch the tool, run the **ProfileExport.exe** from the MUSE installation folder. The default location is **C:\Program Files (x86)\MUSE**.

The tool can be launched from the MUSE application server or a MUSE client workstation.

#### NOTE:

The default authentication mode is Windows. Add **-museauthenticate** to the command-line to run the tool using MUSE Authentication.

### Export a Profile

1. From the MUSE installation folder, launch the **ProfileExport.exe** file. The default location is **C:\Program Files (x86)\MUSE**.

A list of current profiles is displayed on the MUSE system.

2. Select the profile to export.
3. Select **Export**.
4. Type the path and file name.
5. Select **Save**.

The file is saved as an XML file with the name typed in step "4".

## Import a Profile

1. Create a new profile in the MUSE system.

This new profile is a place holder for the imported profile information.

An existing profile can also be used instead of creating a new one.

To create a profile in MUSE, refer to *Profiles* in the *MUSE Cardiology Information System Administrator Manual*.

2. From the MUSE installation folder, launch the **ProfileExport.exe** file. The default location is **C:\Program Files (x86)\MUSE**.

A list of current profiles is displayed on the MUSE system.

3. Select the profile created in Step "1".

4. Select **Import**.

5. Type the path and file name.

6. Select **Open**.

The imported files are copied and the new profile is replaced with the imported file.

## Change the MUSE CSI Order Download Filtering and Sizing

Change the MUSE CSI Order Download filtering and sizing by using the instructions in the following sections. The changes made here affect orders downloaded via the CSI protocol. Orders downloaded via other protocols are not affected by these changes.

These instructions manipulate the MUSE database tables and should be performed only by GE Healthcare MUSE technical support or a MUSE field specialist. The person completing this task should be familiar running queries with SQL Server Management Studio.

### Limit CSI MUSE Order Downloads by Test Type

By default, when you download orders from the MUSE system, orders for all test types are included. You can configure the MUSE application to filter the downloaded orders by test type. Filtering uses the binary bit mask of the number

in the **CSITypeDownload** field of the **MUSE\_System.dbo.cfgSites** table. The default value is 0. When the field contains 0, there is no filtering of the orders.

The following table lists the values for each bit mask and defines the filtering scheme.

**Table 12: Bit Mask Values for Test Types**

Bit	Test Type	Value
1	Resting ECG	1
2	Pacemaker	Not used
3	HiRes	4
4	Stress	8
5	Holter	16

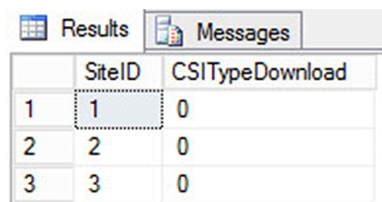
Setting the bit to a value in the bit mask allows that order type to be sent. To send more than one order type, add the values together and use the sum as the value. For example, to send only Resting ECG and HiRes orders, add the values 1 and 4 which equals 5. In this example order types, Stress and Holter, are excluded from the order download. To send only resting ECGs, set the **CSITypeDownload** field to 1.

Use the following procedure, along with the information in the table, to filter orders that can be downloaded from MUSE.

1. Log on to the MUSE application server as the MUSE Administrator.
2. Execute the following query in **SQL Server Management Studio** to determine the current configuration:

```
--- BEGIN QUERY ---
SELECT SiteID, CSITypeDownload
FROM MUSE_System.dbo.cfgSites
--- END QUERY ---
```

The query returns the current values for each MUSE site.



	SiteID	CSITypeDownload
1	1	0
2	2	0
3	3	0

3. For configuration changes, "[schedule a system shutdown](#)".
4. Execute the following query in **SQL Server Management Studio** to change the filtering value, replacing **X** with the filter value and **Y** with the **SiteID** of the site where the filter is to be applied:

```
--- BEGIN QUERY ---
```

```
UPDATE MUSE_System.dbo.cfgSites
SET CSITypeDownload = X
WHERE SiteID = Y
--- END QUERY ---
```

For example, to allow order download for only resting ECG and HiRes on Site 1, add the values **1** and **4**, which equals **5** and run the following query.

```
--- BEGIN QUERY ---
UPDATE MUSE_System.dbo.cfgSites
SET CSITypeDownload = 5
WHERE SiteID = 1
--- END QUERY ---
```

5. Repeat the command for each site that needs to be changed.
6. Verify the changes by re-executing the following query in **SQL Server Management Studio** to determine the current configuration.

```
--- BEGIN QUERY ---
SELECT SiteID, CSITypeDownload
FROM MUSE_System.dbo.cfgSites
--- END QUERY ---
```

7. ["Cancel the System Shutdown" on page 35.](#)

## Increase or Decrease the Number of CSI Order Downloads

By default, when downloading orders from the MUSE system, a total of 100 orders are returned to the requesting device. You can configure the MUSE application to increase or decrease this number of orders.

To change the number of orders that get returned, edit the **CSIMaxOrderDownload** field in the **MUSE\_System.dbo.cfgSites** table. The maximum limit that can be set in the MUSE application is 360 and cart limitations may prevent this number of orders from being stored. It is strongly recommended that the number of orders to be set must not exceed 200.

Use the following procedure to change the number of orders returned by the MUSE system.

1. Log on to the MUSE application server as the MUSE Administrator.
2. Execute the following query in **SQL Server Management Studio** to determine the current configuration.

```
--- BEGIN QUERY ---
SELECT SiteID, CSIMaxOrderDownload
FROM MUSE_System.dbo.cfgSites
--- END QUERY ---
```

3. If changes need to be made to the configuration, ["schedule a system shutdown"](#).

4. Execute the following query in **SQL Server Management Studio** to change the maximum value, replacing **X** with the new max value and **Y** with the **SiteID** of the site where the new max is to be applied:

```
--- BEGIN QUERY ---
UPDATE MUSE_System.dbo.cfgSites
SET CSIMaxOrderDownload = X
WHERE SiteID = Y
--- END QUERY ---
```

For example, to allow a maximum value of 150 on Site 1, run the following query:

```
--- BEGIN QUERY ---
UPDATE MUSE_System.dbo.cfgSites
SET CSIMaxOrderDownload = 150
WHERE SiteID = 1
--- END QUERY ---
```

5. Repeat the command for each site that needs to be changed.
6. Verify your changes by re-executing the following query in **SQL Server Management Studio** to determine the current configuration.

```
--- BEGIN QUERY ---
SELECT SiteID, CSIMaxOrderDownload
FROM MUSE_System.dbo.cfgSites
--- END QUERY ---
```

7. ["Cancel the System Shutdown" on page 35.](#)

## Stress List Management

The Stress List Management procedure provides limited management for the selections that display in the drop-down lists in the MUSE Editor for stress reports. It is not a standard list management tool. Use to adjust the stress menu list in the MUSE Editor only when necessary.

These instructions manipulate the MUSE database tables and only MUSE Technical Support or a MUSE Field Specialist should perform them. The person completing this task should be familiar with running queries with SQL Server Management Studio.

The strings that display in the drop-down lists in the MUSE Editor for stress reports are in the **cfgDataDictUserEnums** table in the **MUSE\_SiteXXXX** database, where XXXX represents the MUSE site number.

These strings can be:

String	Definition
Retired	The value no longer displays in the drop-down list.



String	Definition
Unretired	The value displays in the drop-down list.
Sort order changed	The most frequently used values display at the top of the list.

These changes require that values in the cfgDataDictUserEnums table be altered.

**NOTE:**

Customer inputs are necessary to modify these strings. So, the complete list of strings is copied into an Excel spreadsheet where the customer can review and approve them prior to applying the changes.

**DO NOT** make changes to any values other than those described. Existing strings may have been used on past Stress tests and must be maintained in the same manner. Each drop-down list uses a FieldID number that identifies it in the database, and each selection in the drop-down has an **EnumString** and **EnumID** number that identifies a specific string in the list.

## New String for Stress Tests

Do not use this procedure to create new strings. The MUSE system creates new strings automatically based on new strings existing in newly acquired stress tests.

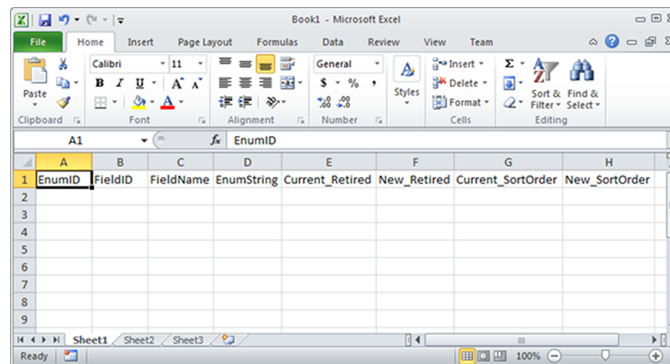
Any new strings sent to the MUSE system do not display in the drop-down lists in the MUSE Editor, for use with any stress tests other than the originally added ones. Any new strings that the customer wants to use with the MUSE system must be unretired using this procedure.

## Create a Worksheet

1. Create an Excel spreadsheet template with the following columns and save it with an appropriate file name.

For example: **FacilityName\_SiteXXXX\_Stress\_Lists.xlsx**, where XXXX is the appropriate site number.

Column Identifier	Column Heading
A1	EnumID
B1	FieldID
C1	FieldName
D1	EnumString
E1	Current_Retired
F1	New_Retired
G1	Current_SortOrder
H1	New_SortOrder



2. Log in to the MUSE application server as MUSE administrator.
3. Launch SQL Server Management Studio and log in to the appropriate SQL Server instance.
4. Run the following SQL Query replacing XXXX with the appropriate MUSE site database:

```
-- BEGIN QUERY --
SELECT EnumID, FieldID,
FieldName =
CASE FieldID WHEN '13482' THEN 'Exercise Nurse'
WHEN '13484' THEN 'Attending Physician'
WHEN '13494' THEN 'Test Type'
WHEN '13507' THEN 'Reason For Test'
WHEN '13546' THEN 'Protocol'
WHEN '13590' THEN 'Arrhythmias'
WHEN '13614' THEN 'Resting ECG'
WHEN '13625' THEN 'ST Changes'
WHEN '13655' THEN 'Overall Impression'
WHEN '13663' THEN 'Chest Pain'
```

```

WHEN '13952' THEN 'Reason for Termination'
WHEN '13969' THEN 'HR Response to Exercise'
WHEN '13974' THEN 'BP Response to Exercise'
WHEN '13979' THEN 'Functional Capacity'
ELSE 'Unknown'
END,
EnumString, Retired as Current_Retired, '' as New_
Retired,
SortOrder as Current_SortOrder, '' as New_SortOrder
FROM MUSE_SiteXXXX.dbo.cfgDataDictUserEnums
WHERE FieldID IN(13482, 13484,
    13494 ,13507 ,13546 ,13590
    ,13614 ,13625 ,13655 ,13663 ,13952 ,13969 ,13974 ,13979)
ORDER BY FieldID
-- END QUERY --

```

5. Paste the results of the query into the template Excel file you created in step "1" starting with cell A2.

EnumID	FieldID	EnumString	Current_Retired	New_Retired	Current_SortOrder	New_SortOrder
781	13507	Reason For Abnormal E	0		1	
782	13507	Reason For Abnormal E	0		2	
783	13507	Reason For Suspected A	0		3	
784	13507	Reason For Screening fc	0		4	
785	13507	Reason For Dyspnea	0		5	
786	13507	Reason For Dyspnea writ	0		6	
787	13507	Reason For Evaluation o	0		7	
788	13507	Reason For Fatigue	0		8	

6. Save the Excel file and send it to the customer with the following instructions:
  - a) Populate Column F (New\_Retired) with a value of 0 for unretired or a value of 1 for retired.
  - b) Populate Column H (New\_SortOrder) with the desired sort order value.  
Sort Order values should not be duplicated within a range of FieldNames. Anything marked as retired in Column F must have a New\_SortOrder value of 500.
7. After you obtain the completed Excel file from the customer, verify that every row has a value of 0 or 1 for Column F (New\_Retired) and a numeric value in Column H (New\_SortOrder).
8. Using the values in these columns, go to ["Retire Strings" on page 59](#) and ["Change the Sort Order of Strings" on page 60](#) to implement the changes.

## Retire Strings

To retire a string, run the following query, replacing XXXX with the appropriate MUSE site database and YYYY with the appropriate EnumID:

```
-- BEGIN QUERY --
UPDATE MUSE_SiteXXXX.dbo.cfgDataDictUserEnums
SET Retired = 1, SortOrder = 500
WHERE EnumID = YYYY
-- END QUERY --
```

## Unretire Strings

To unretire a string, run the following query, replacing XXXX with the appropriate MUSE site database and YYYY with the appropriate EnumID:

```
-- BEGIN QUERY --
UPDATE MUSE_SiteXXXX.dbo.cfgDataDictUserEnums
SET Retired = 0
WHERE EnumID = YYYY
-- END QUERY --
```

## Change the Sort Order of Strings

To change the sort order of a string, run the following query, replacing XXXX with the appropriate MUSE site database, YYYY with the appropriate EnumID, and ZZZZ with the appropriate SortOrder value:

```
-- BEGIN QUERY --
UPDATE MUSE_SiteXXXX.dbo.cfgDataDictUserEnums
SET SortOrder = ZZZZ
WHERE EnumID = YYYY
-- END QUERY --
```

## Combine Unretire and Change Sort Order Queries

A single query can be used to both unretire and change the sort order. To unretire and change the sort order of a string at the same time, run the following query, replacing XXXX with the appropriate MUSE site database, YYYY with the appropriate EnumID, and ZZZZ with the appropriate SortOrder value:

```
-- BEGIN QUERY --
UPDATE MUSE_SiteXXXX.dbo.cfgDataDictUserEnums
SET Retired = 0,
SortOrder = ZZZZ
WHERE EnumID = YYYY
-- END QUERY --
```

## Correct Mistakes

These queries impact the Retired and/or SortOrder columns of the **cfgDataDictUserEnums** table. If any mistakes are made during the process, those mistakes can be corrected by running the queries to change the sort order, retire, or un-retire the string. The original Excel file created in ["Create a Worksheet" on page 57](#) can be used as a reference for the original configuration of the strings.

## 6

# Backend System Tools and Procedures

## Silent Install of the MUSE Client Software

You can silently install the MUSE client. A silent install does not require any user interaction. You can push the installation to multiple client workstations with your preferred enterprise deployment software service (like Active Directory or Windows PowerShell). This is a helpful deployment strategy for facilities with a significant amount of client workstations.

1. Download the MUSE NX installation package and extract the contents to the local drive.
2. From a command prompt, change the directory to the **MUSE Application** on the install media.
3. Type **MuseSetup.exe** followed by the command parameters based on your system configuration.

**Table 13: Required Parameters**

Command	Description
/s	Tells the installer to run the installation in silent mode.
SetupType	Set to <b>MUSE Workstation</b> .
ServerName	Enter the MUSE server name. The MUSE system installs with the default port numbers 8001 and 8002. To install with a different port number, see <a href="#">"Install MUSE with a Non-Standard Port Number" on page 45</a> .

For example, to complete a silent install for a MUSE workstation without the modem option, you would enter:

```
MuseSetup.exe /s SetupType="MUSE Workstation"
  ServerName=MuseServer123
```

Table 14: Optional Parameters

Command	Description
<b>InstallDirectory</b>	Allows you to change the location where the application is installed.
<b>Language</b>	Enter the language for the application. The default language is English.
<b>ServerPort</b>	Only use this option if you are installing the MUSE application with a non-standard port number.
<b>AddWinAuthShortcut</b>	Adds the user authentication type (Windows, MUSE, or LDAP) and shortcut. <ul style="list-style-type: none"> <li>Enter <b>0</b> for no.</li> <li>Enter <b>1</b> for yes.</li> </ul>
<b>AddMuseAuthShortcut</b>	
<b>AddLdapAuthShortcut</b>	
<b>Features</b>	<p>Select the features to install. For the workstation there are two features: Client (mandatory) and the MUSE Modem feature.</p> <ul style="list-style-type: none"> <li>To install only the client, enter <b>Features=Client</b>.</li> <li>To install the client and MUSE Modem feature, enter <b>Features=Client;Client\service\Modem</b>.</li> </ul> <p><b>NOTE:</b> When installing the MUSE Modem feature, the DatabaseServerName, ServiceUsername, and ServicePassword need to be set.</p>
<b>Prefix</b>	The default prefix value is MUSE. Only change the prefix if you are not using the standard system value.

For example, to install the MUSE system with all authentication shortcut types and client features without the MUSE Modem feature, you would type:

```
MuseSetup.exe /s SetupType="MUSE Workstation"
  ServerName=MuseServer123 AddWinAuthShortcut=1
  AddMuseAuthShortcut=1 AddLdapAuthShortcut=1
  Features=Client
```

For example, to install the MUSE system with the Windows authentication shortcut type, in Spanish, and with the client MUSE Modem feature, you would type:

```
MuseSetup.exe /s SetupType="MUSE
Workstation" ServerName=MuseServer123
AddWinAuthShortcut=1 Lanugage=Spanish
Features=Modem DatabaseServerName=MuseDatabase123
ServiceUsername=MuseBkgnd
ServicePassword=MuseBkgndPswd
```

## Move the MUSE Database

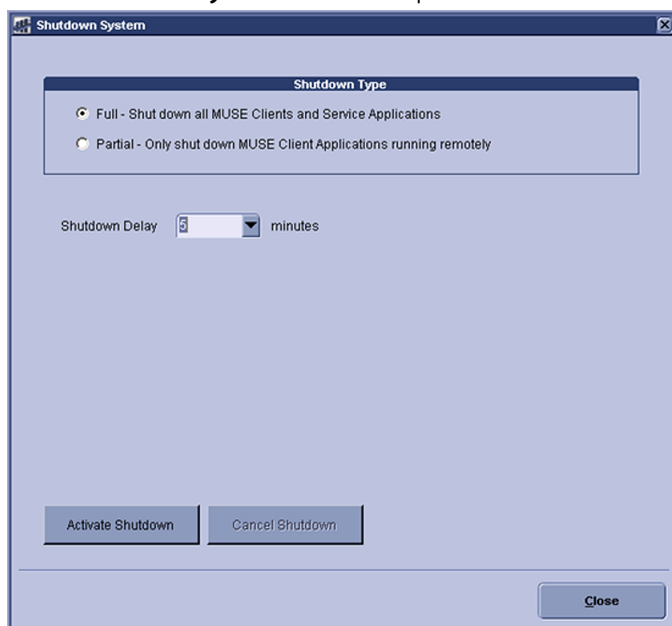
This database relocation method that involves detaching, copying, and re-attaching the system databases.

In a customer-controlled SQL Server environment, there can be other methods used for relocating the system databases. The customer can use a different method to relocate the system databases if the complete databases are copied and an equivalent process is used.

## Schedule a System Shutdown

1. Log on to the MUSE application server as an administrator.
2. In the MUSE application, go to **System > Setup**.
3. In the **Setup** window, select **System**.
4. Right-click on the **Product name** and select **Shutdown System**.

The **Shutdown System** window opens.



5. Select the **Shutdown Type**.
  - Select **Full** to close the MUSE client application and stop MUSE services.

- Select **Partial** to disconnect all remote connections to the MUSE clients. The MUSE clients and the MUSE services continue to run.

**NOTE:**

If the MUSE application stays open on a remote client workstation, the application disconnects from the MUSE server.

6. Select the time for the **Shutdown Delay**.
7. Select **Activate Shutdown**.  
The top of the MUSE client application shows when the shutdown occurs.



## Detach the Database

Before moving the databases, you need to detach them from the existing MUSE system.

1. On the existing MUSE server, open **Microsoft SQL Server Management Studio**.
2. In the **Object Explorer**, expand the **Databases** folder.
3. Right-click on **MUSE\_System** database and select **Tasks > Detach**.  
A dialog box opens showing the settings for detaching the database.
4. Select **OK**.  
The database is detached.
5. Repeat steps "3" and "4" for each MUSE database (**MUSE\_SiteTemplate**, **MUSE\_Site0001**, **MUSE\_Site0002**, and so on).  
When you finish, the databases are not visible in **SQL Server Management Studio**.

## Copy the Database Files

Use the following procedure to copy the MUSE database files from the old server to the new server.

1. Copy all the MUSE database files from the old database server to the new database server or to a new path on the existing server being upgraded.
2. Verify that all the database files are successfully copied.

The following table lists the database files that need to be copied for each database.



<i>Database</i>	<i>Database Files</i>
MUSE_System	<i>MUSE_System.LDF</i> <i>MUSE_System.MDF</i> <i>MUSE_System_Config.NDF</i> <i>MUSE_System_MuseLog.NDF</i> <i>MUSE_System_Queue.NDF</i> <i>MUSE_System_QueueBlob.NDF</i>
MUSE_SiteTemplate	<i>MUSE_SiteTemplate.LDF</i> <i>MUSE_SiteTemplate.MDF</i> <i>MUSE_SiteTemplate_Config.NDF</i> <i>MUSE_SiteTemplate_Test.NDF</i> <i>MUSE_SiteTemplate_TestBlob.NDF</i>
MUSE_Site0001	<i>MUSE_Site0001.LDF</i> <i>MUSE_Site0001.MDF</i> <i>MUSE_Site0001_Config.NDF</i> <i>MUSE_Site0001_Test.NDF</i> <i>MUSE_Site0001_TestBlob.NDF</i>

**NOTE:**

All site database files need to be copied. The files for additional sites use the same file name conventions as **MUSE\_Site0001**.

## Attach the Database to the Server

**NOTE:**

The act of attaching an older version of SQL Server database to a newer version of SQL Server automatically upgrades the database to be compatible with the newer version of SQL Server. Once a database has been upgraded it can no longer be used with the previous version of SQL Server. This is why it is recommended to copy the database to the new location and not simply move it.

The following procedure can be used by a GE Healthcare service representative to attach the MUSE databases to MUSE application server with a local database. Attaching the database to a remote database server is the responsibility of the customer and the following procedure can be used as a guide. The specific steps for attaching the database to a remote database server can vary depending on the customer's SQL Server implementation.

Use the following procedure to attach the MUSE database:

1. Open **Microsoft SQL Server Management Studio** and connect to the SQL Server instance that you use for MUSE.
2. In the **Object Explorer**, right-click on the **Databases** folder and select **Attach**.

3. In the dialog window that opens, click **Add**.
4. Browse to the MUSE database folder (default = <drive>:\Muse\DB), and select **MUSE\_system.mdf**.
- NOTE:**  
The **C:** drive is the default for the SQL database server. If the MUSE system is on a single server, the **D:** drive is the default.
5. Select **OK**.
6. Repeat step "3" through step "5" for each MUSE database (MUSE\_SiteTemplate.MDF, MUSE\_Site0001.MDF, MUSE\_Site0002.MDF, and so on).
7. In the **Attach Databases** dialog windows, select **OK** to attach all the databases.

**NOTE:**

If an error occurs attaching the database(s) and you are certain all the database files are present and accounted for, run **Microsoft SQL Server Management Studio** using the **Run as administrator** function to attach the databases. A symptom of needing to use the **Run as administrator** function is the following error message:

**Database cannot be upgraded because it is read-only, has read-only files or the user does not have permissions to modify some of the files.**

## Update the MUSE Database Server Configuration

After moving MUSE databases, the MUSE installed configuration needs to be modified to point to the new database server. Perform the following steps on the MUSE application server and any MUSE client or modem servers that have the MUSE Modem feature installed:

1. Log on as an administrator to either the MUSE application server or the client workstation.
2. Go to **Control Panel > Programs > Programs and Features**.
3. Right-click on **MUSE** and select **Change**.
4. On the **Welcome to the MUSE Setup Wizard** window, select **Next >**.
5. Select **Next >** to bypass the **MUSE Server Details**.
6. On the **Select Database Server** screen, enter the database server name or use the drop-down menu to select the correct database server.

You must specify the SQL Server by database server name, not by the IP address. If a non-default SQL Server instance will be used, include the instance name.

Default instance example: **SQLSERVER**.

Named instance example: **SQLSERVER\INSTANCE**.

7. Select **Next**.

The installer validates that the database is available. If the database cannot be found, the following message box opens: **Database not found, please manually verify that the database server is correct. Once the database server is available the MUSE Services installed on this box must be restarted. Do you want to continue?**. Select **No**.

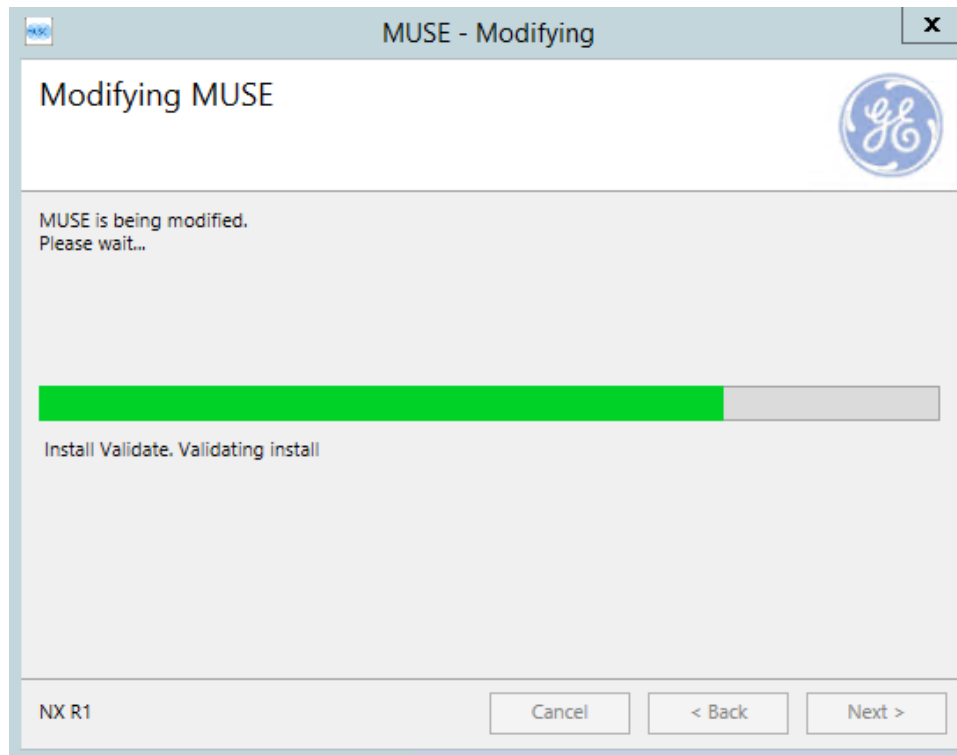
Verify the name and instance of the SQL Server before proceeding. If the database validation is successful, the next screen, **MUSE Select Options**, displays.

8. Select **Next >** until you get to the **MUSE Services Configuration** screen.
9. On the **MUSE Services Configuration** screen, enter the **Background User Password**.
10. Select **Next >**.
11. Enter the **Options Configuration Password**. The **Serial Number** should be pre-populated. If you need to manually enter the serial number, refer to your *Product Activation Sheet*. Then, select **Next >**.

**NOTE:**

Only a qualified GE Healthcare service representative has access to the Options Configuration Password. This password cannot be provided to customers.

12. Select **Next >**.
13. Select **Next >** to confirm installation with the modified settings. The **Modifying MUSE** screen displays installation progress.



14. On the **Modify Complete** screen, select **Close**.

## Cancel the System Shutdown

1. Go to **Services**.
2. Right-click on the **MUSE** service and select **Start**.  
This starts the MUSE MT host service and allows you to log on.
3. Log on to the MUSE application on the MUSE application server.  
The application displays the current shutdown status at the top of the window.



4. In the MUSE application, go to **System > Setup**.
5. Select **System**.
6. Right-click on the **Product name** and select **Shutdown System**.
7. In the **Shutdown System** window, select **Cancel Shutdown**.

If the MUSE services were stopped, they are now restarted and remote connectivity is restored.

The system does not automatically notify users that the MUSE system is available.

## MUSE Report Distribution Configuration Report (DumpReportDist.bat)

The tool **DumpReportDist.bat** installed with the MUSE system writes the MUSE Report Distribution configuration to a file for reference. This tool is installed in the MUSE application folder (default is **C:\Program Files (x86)\MUSE**).

The tool generates two types of reports: by test type or by device type. The Test Type Report sorts the output of the report distribution configuration by test type. The Device Type Report sorts the output by device number.

To execute this command-line tool, perform the following steps:

1. Log on to the MUSE application server as the MUSE Administrator.
2. Launch the Windows **Command Prompt** using **Run as Administrator**.
3. Change to the location of the MUSE application folder.
4. Execute **DumpReportDist.bat** with command-line parameters specified in the following tables.

**Table 15: Command String**

Usage	<p><b>DumpReportDist [/r:reportType] [/f:filename] [/db:dbname] [/s:dbserver]</b> where:</p> <p><b>/r:reportType</b> = 0 for Test Type Report (0 is default), 1 for Device report.</p> <p><b>/f:filename</b> = Output file name (default is <b>ReportDistribution.txt</b> in current folder).</p> <p><b>/db:dbname</b> = Site database to use in <b>MUSE_Sitexxxx</b> format (default is <b>MUSE_Site0001</b>)</p> <p><b>/s:dbserver</b> = Name of the database server (default is <b>local</b>)</p>
-------	--

Command/Usage Example	Description/Result
<b>DumpReportDist /r:0 /f:c:\temp\site1_type.txt /db:MUSE_Site0001</b>	Database server is <b>local</b> . Outputs Test Type report named <b>c:\temp\site1_type.txt</b> with MUSE Site 1 database.
<b>DumpReportDist /r:1 /f:c:\temp\site2_dev.txt /db:MUSE_Site0002 /s:SQLMAIN1</b>	Database server is named <b>SQLMAIN1</b> . Outputs Device report named <b>c:\temp\site2_dev.txt</b> with MUSE Site 2 database.

## Retrieve MUSE Error Logs on the SQL Server Management Studio

1. Open **SQL Server Management Studio**.
2. Select **New Query**.

A blank query window opens.

3. Select the **MUSE\_System** database.
4. Type the following SQL query into the blank window, where **<tablename>** is replace by the table name of the log that you want to retrieve.

***SELECT \* FROM <tablename>***

The following table lists the **<tablename>** values for the associated logs.

<b>MUSE Log</b>	<b>&lt;tablename&gt;</b>
Application	logApplication
DICOM	logDicomTransaction
Acquisition	lognormal
Process	logProcess
HIS Event	logHISEvent
Print	logTransmit
Discard	logDiscard
Edit Change	logEditChange

5. Execute the query.  
Results are displayed.
6. Right-click in the results and select **Save Results As**.
7. Provide a file name and location and save the results.

## Holter Recreate Tool

The Holter Recreate Tool is a script that searches all MUSE sites for Holter reports in the MUSE system prior to the release of MUSE v9.0.4 (SP4). If Holter report is regenerated, the date of the PDF report will also be updated in the database and it will not be selected by the script in subsequent runs.

The script stops if it is run multiple times. The script has a built-in throttle mechanism to process not more than two Holter reports at one time. This prevents the system from overloading the format queue and/or locking out any reports coming in through the normal workflow process.

**NOTE:**

The **C:** drive is the default for the SQL database server. If the MUSE system is on a single server, the **D:** drive is the default.

1. Log in to the MUSE application server as MuseAdmin or MuseBkgnd.

2. In the mounted ISO file directory, go to **MUSE\_NX\_Support\Holter Recreation Tool** to access the **MuseBackendTestingEngine.exe** and **HolterRecreate.xml** files.
3. Copy **MuseBackendTestingEngine.exe** to the MUSE installation folder on the application server (default folder location is **<drive>:\Program Files (x86)\Muse**).
4. Create a folder at the root level of the drive named **Scripts**. For example, **C:\Scripts**
5. Copy the **HolterRecreate.xml** to the **Scripts** folder.
6. Record the name of the MUSE database server.
7. Open a command prompt with **Run as Administrator** and type **<drive>:\Program Files (x86)\Muse>MuseBackendTestingEngine -path:<drive>:\Scripts\ -workflow:<drive>:\Scripts\HolterRecreate.xml -dbServer:<name of MUSE database server>**

For example, **C:\Program Files (x86)\Muse>MuseBackendTestingEngine -path:C:\Scripts\ -workflow:C:\Scripts\HolterRecreate.xml -dbServer:GBFVJVF2E**

# 7

## System Maintenance and Functional Checkouts

The maintenance information available is only for the MUSE system software. GE Healthcare no longer supplies hardware with MUSE systems. Some hardware previously supplied with legacy MUSE systems is compatible with the MUSE system. This manual does not contain any information on GE Healthcare supplied hardware, including repair and maintenance procedures.

### Hardware Maintenance and Repairs

Whenever a system is serviced, you must perform checkout procedures to comply with FDA guidelines and to ensure that the system is safe and functioning properly. The specific procedures depend on the service performed.

The customer is responsible for any task related to hardware repair like troubleshooting, spare part replacement, and checkouts, as they relate to hardware repairs on the system servers.

For hardware supplied with legacy versions of the MUSE system, refer to the appropriate legacy MUSE Service Manual.

**NOTE:**

Unless you have an Equipment Maintenance Contract, GE Healthcare does not assume responsibility for performing the recommended maintenance procedures. The sole responsibility rests with the individual or institution using the equipment.

### OEM Maintenance

For information on maintenance of Original Equipment Manufacturer (OEM) components, refer to the appropriate OEM manuals for the recommended maintenance of their product.



## System Functional Checkouts

System functional checks typically involve system setup and configurations that you can perform remotely or onsite. If you perform them remotely, the remote support engineer can confirm them through remote access or verify them with the customer contact.

### Inbound Device Checkouts

Make sure that inbound devices are working correctly. Common inbound devices include:

- MUSE Modem feature for CSI modems, CSI network, and CSI direct
  - Devices with DCP inbound communication
  - Shared folder and Generacq service for devices like MARS, CASE/CardioSoft, MUSE Monitoring Gateway, and eDoc Connect
  - MUSE XML format
1. Transmit a test from the inbound device.
  2. Verify that the test is acquired into the MUSE system.

### Outbound Device Checkouts

Make sure that outbound devices are working correctly.

1. Use the **Print Test** function to send a test to an outbound device defined in MUSE.
2. Verify that the outbound device received the test output.
3. Verify that the output format matches the set format.

### Report Distribution Checkout

Make sure that the report distribution function is working correctly.

1. Review the report distribution configuration and report destination location.
2. Complete the following common tasks for to generate a report:
  - Acquire a patient test.
  - Complete patient demographics.
  - Configure report settings for the patient test.
3. Send the report.
4. Verify the report was received from the MUSE system and sent to the correct report location.

## User Authentication Checkout

1. Have the user log on to the MUSE system with one or more of the authentication methods (based on customer's configuration):
  - MUSE authentication
  - Windows authentication
  - LDAP authentication
  - Windows + LDAP authentication.
2. Verify the user is able to successfully log on to the MUSE system.
3. Verify that the user has the correct access based on their assigned roles and privileges.

## Edit Record Checkout

1. Have the customer open a record on the **Edit** list.
2. Update the record in the **Edit** list.
3. Open the record to verify that the changes were saved.

## Confirm Record Checkout

1. Have the customer open a record on the **Edit** list.
2. Have the customer confirm the record.
3. Do a retrieval of the record and verify that it is now in the database.

## Manual Database Search Checkout

1. Go to the **Database Search** function of the application.
2. Create a search.
3. Choose criteria and run the search.
4. Verify that the search results match the selected criteria.

## Automatic Database Search Checkout

1. Go to the **Database Search** function of the application.
2. Create a search.
3. Save the criteria.
4. Schedule the search.
5. Verify that the search runs when scheduled and expected results are generated.  
The MUSE system runs all scheduled searches only once per day.

## Patient Test Data Checkouts

Make sure that patient test commands are working properly for discarding, recovering, and deleting a patient test.

1. Request the user select a patient test that can be discarded and eventually deleted. If no patient test is available, have the user create a phony patient test.
2. Have the user discard a test from a MUSE site database.
3. Verify that the test was discarded and displays on the **Discarded Data List** and as a log entry on the **Discard Log**.
4. Have the user recover a test from the **Discarded Data List**.
5. Verify that the test was recovered and displays on the appropriate MUSE site database and as a log entry on the **Discard Log**.
6. Have the user delete a test from the **Discarded Data List**.
7. Verify that the test was deleted from the system and is displayed as a log entry on the **Discard Log**.

## MUSE Web Client Data Retrieval Checkout

Make sure that the MUSE web client can retrieve data from the MUSE system by checking the system configuration files and the web client search function.

1. Open the MUSE system configuration website to verify that the MUSE Web API is communicating with the MUSE application server.
  - a) In the **URL** field, type your URL for the MUSE web client with the appended directory **api/systemconfig**. For example, the URL would be ***https://mymusewebclient.com/api/systemconfig***.
  - b) Verify that the values for the system configuration indicate an active connection between the MUSE Web API and the MUSE application server.
  - c) Close the browser.
2. Open a web browser.
  - a) In the **URL** field, type your URL for the MUSE web client.  
If prompted, log in as a user who has access to MUSE web client.
  - b) In the **Search by PID or Name** field, type the patient ID or name.
  - c) Find the record to verify that MUSE web client responds to the search request and is working properly.
  - d) Close the browser.

## Remote Support

Make sure that you can access the system for remote support.

1. Log on to the customer's system using InSite ExC.

2. Confirm that you can access the customer's desktop via the remote connection.

## HIS/CCG Checkouts

Make sure that the HIS and CCG functions are working correctly.

### HIS ADT/Orders Inbound Checkout

1. From the MUSE system, go to the **HIS Event Log**.
2. Verify that **Inbound ADT** and **Order** events exist.
3. Have the customer verify that the MUSE system is receiving the data they are sending from their interface.

### HIS Realtime Results/Billing Outbound Checkout

1. From the MUSE system, go to the **HIS Event Log**.
2. Verify that **Outbound Results/Billing** events exist.
3. Verify that outbound data is leaving the MUSE results/billing queue.

### HIS Batch Billing

1. From the MUSE system, go to **System > Status**.
2. View the **HL7 Batch Log** and verify that the **Batch** was successfully sent.

### Order Download from MAC Cart Checkout

1. From a MAC cart, use the **Order Download** function.
2. Verify that the MAC cart is able to download the order from the MUSE system.

## DICOM Checkouts

Make sure that DICOM features are working correctly.

### Receive a DICOM Test into the MUSE System

1. Send a DICOM test from a DICOM Storage Service Class User device into the MUSE system.
2. Verify that the test is acquired into the MUSE system.

### Send a DICOM Test from the MUSE System

1. Use the **Print Test** function of MUSE to send a test to an outbound DICOM IOD or PDF device defined in MUSE.
2. Verify that the test is transmitted from the MUSE system to the receiving DICOM system.

### Query a DICOM Order

Verify orders from the DICOM Modality Worklist Service Class Provider are visible in the MUSE system.

# 8

## Disaster Recovery

### MUSE System Backup and Recovery

A backup and recovery plan is crucial to prevent data loss and to minimize service interruption in the event of system failure or disaster. All MUSE installations are software-only, customer-supplied hardware configurations. With the release of the MUSE application, previous tape and network backup configurations utilized in GE Healthcare-supplied hardware configurations are no longer documented or supported.

It is the customer's responsibility to configure and monitor backup and disaster recovery procedures and to execute those procedures as necessary. GE Healthcare is not liable for any loss of data, your inability to access data, any failure of system performance, or any claims that would otherwise potentially be covered by your warranty, if any such problem results from, or arises out of, your selected backup or disaster recovery procedures. GE Healthcare service representatives may still be able to assist you in correcting such a problem, on a billable basis.

### Windows Operating System and SQL Server

Backing up the Microsoft Windows operating system and SQL Server is the responsibility of the customer.

Customers must decide if they want to perform backups of the Windows operating system and SQL Server in the case of disaster recovery.

### MUSE System Software

Backing up MUSE system software and configuration is the responsibility of the customer.

The MUSE application and MUSE related software can be re-installed in the case of a disaster recovery situation.

Extra steps can be taken to backup the configuration files for each of these items to aid in restoration in a disaster recovery situation.

<b>MUSE Software</b>	<b>Configuration Files</b>
MUSE application	<p><b>File:</b> <i>server.remoting.config</i></p> <p><b>Description:</b> Contains the MUSE port information for the MUSE server; default is 8001 and 8002.</p> <p><b>Default Location:</b> <i>C:\Program Files (x86)\MUSE</i></p>
MUSE Web API	There are no configuration files to restore for the MUSE Web API. After a disaster, reinstall the MUSE Web API to reconnect to the MUSE application server and inherit configuration settings.
InSite ExC	Use the instructions in the InSite ExC Installation document to back up the InSite ExC configuration to a file.

To save the configuration files for system backup, use the **MUSESaveSettings.exe** utility to save important server and workstation settings. See ["Record the Existing Server Configuration" on page 78](#) for more information.

## Record the Existing Server Configuration

Server configuration information can be manually recorded or automatically saved to a configuration file to automatically populate your system configuration settings in the MUSE Installer (MuseSaveSettings.exe).

### Save the Existing Server Configuration with MuseSaveSettings.exe

#### NOTE:

If upgrading the MUSE system from v7 to the latest version, see ["Manually Record the Existing Server Configuration for MUSE v7 Upgrades" on page 80](#). The configuration details need to manually recorded. You cannot use the MuseSaveSettings.exe file in the MUSE Installer or by command line.

The **MuseSaveSettings.exe** file runs a system script to record the server configuration details. During the installation of the MUSE application, the MUSE Installer gets the configuration information from this file.

The following information is saved with the MUSE database during an upgrade and as part of the **MuseSaveSettings.exe** file:

- The customer identification for the site database (**CustomerID**)
- MUSE database language (**DBLanguageID**)
- MUSE service user account names (MuseAdmin and MuseBkgnd)

#### NOTE:

If this is changing as part of the MUSE upgrade, record both the old MUSE Administrator account and new MUSE Administrator account information.

- MUSE application folder location
- MUSE application server name and port
- MUSE database folder location
- MUSE database server name, instance, and port

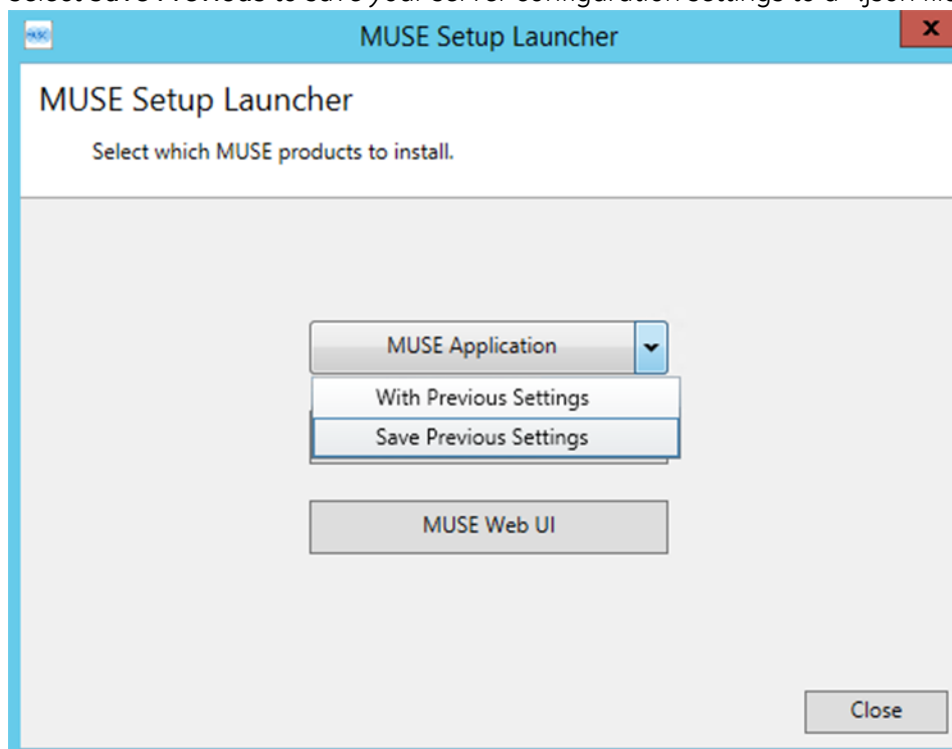
- MARS connectivity settings
- Monitoring Gateway connectivity settings
- CASE connectivity settings

You can automatically save your server configuration settings to a file with the MUSE Installer or by command prompt. The type of file created is in json format, so the file name must have a \*.json extension.

### Use the MUSE Installer to Run MuseSaveSettings.exe

Open the MUSE Installer and select the drop-down arrow on the **Application** button.

Select **Save Previous** to save your server configuration settings to a \*.json file.



### Use the Command Prompt to Run MuseSaveSettings.exe

To automatically save your server configuration settings to a file, open a command prompt and type:

```
MuseSaveSettings [enter file location and name].json
```

For example, ***MuseSaveSettings "C:\Program Files (x86)\Muse\muse9settings.json"***. Use quotation marks to encase the file location and name if there are any white spaces in the directory names.

### Final Steps to Record Configuration Information

There are some configurations items that cannot be saved with the **MuseSaveSettings.exe** file. This information must be recorded before installing the latest MUSE system.

<b>Information Needed</b>	<b>Where to Find the Information</b>
Statement Library language	To identify the Statement Library language, go to the Statement Library within MUSE setup and verify the language of the existing statements.
MUSE service account passwords	The passwords for the MUSE service accounts (MuseAdmin and MuseBkgnd) are not recorded in the MuseSaveSettings.exe file for system security. Manually record the service account passwords.
New MUSE application server name	If the MUSE application server name is changing as part of the upgrade, record the new name here.
New MUSE database server name	If the MUSE database server name is changing for the upgrade, record the new name here.
New MUSE database server name instance	If the MUSE database server name Instance is changing for the upgrade, record the new name Instance here.

### Manually Record the Existing Server Configuration for MUSE v7 Upgrades

If upgrading the MUSE system from v7 to the latest version, the configuration details need to manually recorded. You cannot use the MuseSaveSettings.exe file in the MUSE Installer or by command line.

Record this information in an external electronic file, such as Excel, that can be used for later reference.

<b>Information Needed</b>	<b>Notes</b>
CustomerID	<p>Use the following steps to identify if the site uses a special customer ID:</p> <ol style="list-style-type: none"> <li>1. Use SQL Server Management Studio to log in to the SQL Server instance hosting the MUSE databases.</li> <li>2. Open a <b>New Query</b> window and execute the following query: <b>select CustomerID from MUSE_System.dbo.cfg System.</b></li> <li>3. Record the value for <b>CustomerID</b>. 0 means default.</li> </ol>



Information Needed	Notes
MUSE Database Language	<p>Use the following steps to identify the MUSE database language:</p> <ol style="list-style-type: none"> <li>1. Use SQL Server Management Studio to log in to the SQL Server instance hosting the MUSE databases.</li> <li>2. Open a <b>New Query</b> window and execute the following query: <b><i>select CustomerID from MUSE_System.dbo.cfg System.</i></b></li> <li>3. Record the value for <b>DBLanguageID</b>.</li> </ol>
Statement Library Language	To identify the statement library language, go to Statement Library within MUSE setup and verify the language of the existing statements.
Current MUSE version installed	<p>Use the following steps to locate the version number:</p> <ol style="list-style-type: none"> <li>1. Run the MUSE Application.</li> <li>2. From the top menu bar, select <b>Help &gt; About MUSE</b>.</li> <li>3. Record the number listed next to <b>Product Version</b>.</li> </ol>
MUSE Administrator Service Account Account Name Account Password	These are components of the Windows account and are used for performing administration activities on the MUSE system. If this is changing as part of the MUSE upgrade, record both the old MUSE Administrator account and new MUSE Administrator account information.
MUSE Background Service Account Account Name Account Password	These are components of the Windows account and are used for starting MUSE services on the MUSE system. If this is changing as part of the MUSE upgrade, record both the old MUSE Background account and new MUSE Background account information.
MUSE Application Folder Location	<p>Record the drives and paths where the MUSE application and database are installed.</p> <p><b>NOTE:</b></p> <p>The MUSE application and database may reside on different servers. If the database is not going to be moved during the upgrade, you do not need to record the database folder location.</p>

Information Needed	Notes
MUSE Database Folder Location MUSE Port Number	This information is entered during the installation. You can find the current server name and port number in the <b>muse.remoting.config</b> file in the MUSE Application installation folder (default = <b>c:\Program Files\MUSE</b> ). In the following example, <b>MUSE007HospitalName</b> (a) is the server name and <b>8001</b> (b) is the port number.
Current MUSE Database Server Name Current MUSE Database Server Named Instance	If the MUSE Database is installed on a remote database server, record the name of the database server. If the MUSE database is not installed in the default instance, note the SQL Server <b>Named Instance</b> . The on-site Database Administrator (DBA) must supply this information.
New MUSE Application Server Name	If the MUSE Application Server Name is changing as part of the upgrade, record the new name here.
New MUSE Database Server Name	If the MUSE Database Server Name is changing for the upgrade, record the new name here.
MARS Connectivity Settings Monitoring Gateway Connectivity Settings	Use the following steps to locate the settings: <ol style="list-style-type: none"> <li>1. Use SQL Server Management Studio to log in to the SQL Server instance hosting the MUSE databases.</li> <li>2. Open a <b>New Query</b> window and execute the following query: <b>select EntryString from MUSE_System.dbo.cfgServiceGeneracq.</b></li> <li>3. Record the Value for <b>EntryString</b> (IP address or Name) for any MARS workstations or Monitoring Gateways listed in the results. MARS systems have "reports" in the UNC name and Monitoring Gateways have "acqmon" in the UNC name.</li> </ol>
CASE Connectivity Settings	Record the name of the shared acquisition folder (default is <b>CASE8000</b> ) and the usernames that have permissions to write to the folder (default is a user group called MUSE Acq Users) that contains the user <b>CASE8000</b> .

## MUSE Database Backup

Backing up the MUSE database is the responsibility of the customer.

The MUSE databases must be backed up on a regular basis; the frequency and recovery model is up to the customer.

MUSE databases use the **SIMPLE** recovery model by default. This means that you can restore from your last backup. Any data changes since the last backup are lost. If you want more protection, you can modify the SQL database recovery model.

Knowledge of the MUSE database helps you understand the backup requirements. The MUSE system uses the SQL Server database management system (DBMS) and includes the following default user databases:

- MUSE\_Site0001
- MUSE\_SiteTemplate
- MUSE\_System

The DBMS also includes additional sites if they exist. For example, **MUSE\_Site0002**, **MUSE\_Site0003**, and so on.

## MUSE Database Restoration

MUSE database restoration is the responsibility of the customer.

Follow Microsoft's instructions for restoring a SQL Server backup using **SQL Server Management Studio** or other restoration method used by your facility.

To ensure data integrity, it is crucial that you back up or restore all databases together. Backing up or restoring individual databases could result in data mismatches, database errors, or data corruption.

For example, do not restore **MUSE\_Site0001** without also restoring **MUSE\_System**, **MUSE\_SiteTemplate**, and any other **MUSE\_SiteXXXX** databases that are part of the MUSE system.

## MUSE Application Server Disaster Recovery

Recovering the MUSE application server disaster recovery is the responsibility of the customer.

System rebuild and replacement, including operating system and SQL Server installation, must be completed before GE Healthcare service personnel can aid in re-installing MUSE software.

The following are the high-level steps to restore the MUSE Application Server in the event of a complete system failure.

1. Install physical server.
2. Install operating system and SQL Server.
3. Restore MUSE databases.
4. Install MUSE system software.
5. Restore MUSE system software configuration(s).
6. Reconnect MUSE clients.
7. Reconnect device(s) such as MARS, CASE, MAC carts, as necessary.

Refer to the appropriate MUSE documentation for the installation of the MUSE system software, clients, and devices.

## MUSE HL7 Interface (CCG) Backup and Recovery

A backup and recovery plan for the HL7 server is crucial to ensure that you can recover the HL7 configuration should the server fail or files become corrupted. Coordinate recovery of the HL7 System State with the GE Healthcare HL7 engineer.

### MUSE HL7 Interface (CCG) Configuration Backup and Restoration

GE Healthcare configures a weekly backup of the HL7 configuration as a Windows scheduled task called **System\_State\_Recurring\_Backup**. This scheduled task saves the configuration to the **SystemState** folder of the drive where the CCG software is installed.

The customer is responsible for making a copy of this folder and saving it to a network drive or external media.

The GE Healthcare HL7 engineer performs the configuration restoration .

### MUSE HL7 Interface (CCG) Disaster Recovery

The following are the high-level steps to restore the MUSE HL7 Interface (CCG) in the event of a complete system failure.

1. Install server.
2. Install operating system.
3. Install MUSE HL7 interface (CCG) software.
4. Restore MUSE HL7 interface (CCG) software configuration(s).
5. Reconnect to MUSE application server.

Refer to the *MUSE Cardiology Information System Centricity Clinical Gateway (CCG) Installation Manual* for instructions to install the MUSE HL7 Interface (CCG) software.

## MUSE Test System Disaster Recovery

MUSE test systems have the same expectations and follow the same system backup and restore, database backup and recovery, and HL7 configuration backup and recovery as production systems. Refer to the correct section based on the test system component. In some cases, SQL Server and MUSE HL7 interface software can be installed on the same test system.

## MUSE Client Disaster Recovery

MUSE clients can be rebuilt from scratch in a disaster recovery situation.

1. Install physical workstation.
2. Install operating system.
3. Install MUSE application software.

4. Reconnect to MUSE application server.

See the *MUSE Cardiology Information System Installation and Upgrade Manual* for the installation of the MUSE application software.

**NOTE:**

Some client hardware previously supplied with legacy MUSE systems may not be compatible with the latest release of MUSE. This manual does not contain any GE Healthcare supplied hardware information, repair, or maintenance procedures. For hardware supplied with legacy versions of the MUSE system, refer to the appropriate MUSE legacy service manual.

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# Optional Hardware Accessories

MUSE is a software-only product. Additional hardware may support devices interfacing with the MUSE system. Some of these are listed below. Note that specific models are subject to change, and the parts are current at the time of publication.

## MultiTech MT9324ZBA Modem

Modems are used to transmit patient ECGs from the ECG Cart to the MUSE server. For additional information on a modem other than the MultiTech MT9324ZBA, go to the MultiTech Web site to see the appropriate user guide for the modem.

MultiTech Modem Drivers can be found on the MUSE support disc. Instructions for installing the modem drivers are located in the MultiTech Modem MT9234ZBA Driver Installation documentation.

For specifications for the MultiTech MT9324ZBA modem, see the MultiTech website.

## LED Connectors

The LED indicators on the front panel indicate status, configuration, and activity.



LED Indicator Name	Description
TD — Transmit Data	Flashes when the modem is transmitting data to another modem.
RD — Receive Data	Flashes when the modem is receiving data.
CD — Carrier Detect	Lights when the modem detects a valid carrier signal from another modem. It is on when the modem is communicating with the other modem and off when there is no connection.

<b>LED Indicator Name</b>	<b>Description</b>
OH – Off-Hook	Lights when the modem is off-hook, which occurs when the modem is dialing, online, or answering a call.
TR – Terminal Ready	Lights when a communication program is using the modem. It means the modem is ready for an outgoing or incoming call. It goes off when the communication program disconnects the serial port. When it goes off, a connected modem also disconnects.
Power	Lights when the system is applying power to the modem.

## Replacement Parts

<b>GE Part Number</b>	<b>Description</b>
2003097-001	Fax/CSI/Xmodem Modem Kit 120V
2003097-002	Fax/CSI/Xmodem Modem Kit 220V

## Barcode Reader

GE Healthcare purchased the barcode readers that can be used with your system from the original equipment manufacturer (OEM). Due to the constant changes in design and specifications, refer to the OEM Web sites for additional information not located in this manual.

### Handheld 3800G Barcode Reader

For barcode specifications, refer to the user's guide found at the OEM website.

The following parts are available.

<b>GE Part Number</b>	<b>OEM Part Number</b>	<b>Description</b>
2038834-001	3800G04-USBKITE or HHP-1300G-2USB	BARCODE SCANNER, HANDHELD, USB
2040065-001	42206132-02E	BARCODE SCANNER 3800G PS/2 CABLE

### Handheld Flexpoint HS-1M Barcode Reader

For barcode specifications, refer to the user's guide found at the OEM website.

All replacement parts are provided by Jadak. See the Jadaktech website.



# MUSE Database Language Change Tool

Use the following procedures to install, run, and verify the MUSE Database Language Change Tool.

## Install the MUSE Database Language Changer Tool

1. Log on to the MUSE server as a user with administrator rights.
2. In the MUSE system directory, go to **Support\Database Language Changer**.
3. Copy the file **MuseDBLanguageChanger.exe** into the MUSE application folder.

## Run the MUSE Database Language Change Tool

1. Log on to the MUSE application server as **MuseAdmin**.
2. Open a command prompt and change the directory to the MUSE installation folder.
3. Enter **MUSEDBLanguageChanger.exe**.  
The **MUSE Database Language Change Tool** opens.
4. Enter the settings to change the MUSE database language.
  - a) Type the name of the server where the database is located.  
Use the default value (**local**) if the database is located on the same computer from which you are running this tool.  
For databases in a named instance, use the format *ServerName\InstanceName*.
  - b) Type the prefix for the MUSE database, if it is different from the default (**MUSE**).



- c) Select the new language and indicate if the ECG statements should be in English.
5. Select **Start** to start the database language conversion.  
The MUSE Database Language Change Tool log file is located at **C:\ProgramData\MUSE\MUSEDLanguageChanger.log**.  
A dialog box displays to confirm the conversion is complete.  
**NOTE:**  
The conversion time is dependent on the number of sites and may be lengthy if the system has a large number of MUSE sites.
6. Select **OK** to close the completion dialog box.
7. Select **Exit** to close the **MUSE Database Language Change Tool**.

## Verify the MUSE Database Language Change

1. From the MUSE application, go to **System > Setup**.
2. Open **System Properties** and verify the two-letter **Database Language** value matches the expected database language.
3. To identify the statement library language, go to the **Statement Library** within MUSE setup and verify the language of the existing statements.



# National Health Service of Great Britain (NHS) Patient Identifiers

The National Health Service of Great Britain (NHS) requires applicable systems to comply to the national unique patient identifier schema specified in the *Information Standards Board for Health and Social Care in DSC Notice 32/2008 NHS Number Standard for Secondary Care (England)*.

Implementing the NHS number feature brings the MUSE system into compliance with these requirements.

## Overview

The NHS assigns a 10-digit number to uniquely identify a person within the NHS domain. Systems that comply must validate and verify this number on input into the system and display the validation and verification status of the numbers. The number is validated using the modulus 11 algorithm, its tenth digit being the *checksum*. The number is verified in relation to the main NHS registry system to check existence and demographics correctness. It is also required that a compliant system display the NHS number in the 3 3 4 format on screen and on printed and exported output, that is, 123 456 7121 to enhance readability and to allow users to enter the Patient ID (PID) with or without spaces when searching for a patient or entering a new Patient ID.

For more information on installing the NHS number feature, see ["Install the NHS Number Feature" on page 93](#).

## Number Validation

When the PID is inserted or modified in any patient test, the system runs the NHS Number validation algorithm. If the PID fails validation, the system displays the **Invalid PID** string in the mismatch display area of the MUSE Editor. The check digit validation has five steps:

1. Multiply each of the first nine digits by a weighting factor as follows:

<i>Position</i>	<i>Factor</i>
1	10
2	9
3	8
4	7
5	6
6	5
7	4
8	3
9	2

2. Add the results of each multiplication together.
3. Divide the total by 11 and establish the remainder.
4. Subtract the remainder from 11 to give the check digit.
  - If the result is 11, then use a check digit of 0.
  - If the result is 10, then the NHS Number is invalid and not used.
5. Check that the remainder matches the check digit.  
If it does not match, the NHS Number is invalid.

## Number Verification

The MUSE system receives the PID verification status from the Hospital Information System (HIS) through the Inbound HL7 interface. The **PID** segment (Field 32, component 1) of ADT messages is used. The following table lists the valid numeric values for this field, along with their corresponding string enumeration:

**Table 16: PID Verification Status Codes**

<i>Code</i>	<i>Description</i>
01	Number present and verified
02	Number present but not traced
03	Trace required
04	Trace attempted - No match or multiple match found

<i>Code</i>	<i>Description</i>
05	Trace needs to be resolved - NHS Number or patient detail conflict
06	Trace in progress
07	Number not present and trace not required
08	Trace postponed (baby under six weeks old)

If the HIS does not provide the verification status with the ADT data, then the ADT data stored on the MUSE system for the patient is marked as **Number present and verified**. The MUSE system verifies the NHS Number (Patient ID) in tests using the following rules:

- If the site has **ADT Query** or **ADT Interface** enabled, and the ADT data is found for the Patient ID and no PID/Name mismatches exist, the Patient ID status is set to the ADT data.
- If the site has **ADT Query** or **ADT Interface** enabled, and the ADT data is found for the Patient ID and a PID/Name mismatch, the Patient ID is marked as **Trace needs to be resolved**.
- If the site has **ADT Query** or **ADT Interface** enabled, and ADT data is not found for the Patient ID, and the Patient ID is not a **NO PID**, **all nines**, or **all zeros**, then the Patient ID is marked as **present but not traced**.
- If the Patient ID is **NO PID** or **all nines**, that is 999999999, or **all zeros**, that is, 000000000, the Patient ID is marked as **Number not present**.
- When the test is set to **Demographics Complete**, the Patient ID verification status is marked as **verified**.

## Search by Patient ID (PID)

The NHS number requirements specify that when users or other systems query the MUSE system for patient data by NHS number, the number need not be formatted in the 3 3 4 format, for example, *111 111 2222*, *11 1111 222 2*, or *1111112222*. However, these values successfully return identical results for PID: *111 111 2222*.

The design normalizes all user and system input regarding PID to the PID storage format. It was necessary to capture all points input into the system regarding PID, as follows:

- Editor
- Normalization
- HL7 Inbound Parser
- CSI Patient/Order queries
- DCP Patient/Order queries

## Display the Patient ID

The NHS number requirements specify that the NHS number must be in the 3 3 4 format wherever displayed on the MUSE system.

The design for this, even though not optimal from a storage point of view, stores the NHS number in the 3 3 4 format, that is, *111 111 2222*. The reasons for doing this are:

- Since the data is stored in the format in which it is displayed, no reformatting needs to be performed to display lists of tests in the MUSE Editor, MUSE web client, ECG carts, CASE, MUSE database search, and MUSE logs. Also, no reformatting is necessary to display PIDs in data export formats, for example, postscript, PCL, PDF, XML, and so forth.
- The option to store the NHS numbers *spaceless* still requires data input normalization: normalizing PIDs to spaceless, plus additional code required to format PID at all of the points of export. With a large collection of data layers, this adds a great deal of complexity.
- It requires very slight optimization in displaying lists containing PIDs, since they do not need to be *post processed*.
- There is a precedence in the MUSE system to store Swedish and Danish PID formats that contain the dash ( — ) character (used as a separator) with the character in the database.

## Install the NHS Number Feature

The NHS Number Feature can be enabled during initial MUSE database installation or manually by changing the customer ID of the system.

### Enable NHS Number during Initial MUSE Database Installation

The NHS Number feature is enabled by selecting a **Customer value** of **NHSNUMBER** during the installation of a new MUSE database. Refer to the *MUSE Cardiology Information System Installation and Upgrade Manual* for information on installing the MUSE database and selecting the **Customer value** during the installation.

The MUSE installer cannot be used to change the customer value after the database has been installed; it can only be used during the creation of a new database.

### Enable NHS Number by Manually Changing the Customer ID of the System

1. Log on to the MUSE system as MUSE Administrator.
2. *"Schedule a system shutdown."*
3. Using **SQL Server Management Studio**, log on to the SQL Server instance where the MUSE databases reside.
4. Open **New Query** and execute the following query:

**update MUSE\_System.dbo.cfgSystem set CustomerID=17**

The command returns a series of results as **(1 row updated)**.

5. *"Cancel the system shutdown."*
6. From the MUSE application, go to **System > Setup**.
7. Open **System Properties** and verify that the **CustomerID** is 17.

## Updating Legacy System Data

### Utility

Since NHS may be added to an existing MUSE system that already contains patient data, a utility brings the current data into a consistent state required by the NHS number implementation. The utility is called **NHSNumberUpdate.exe** and is located in the **NHS Number Update** folder on the MUSE Support media.

The utility sets the various PIDs in the proper format and adds a verification status. The following list details the order that verification status occurs.

1. Sets HIS Patient IDs to the correct format and sets verification status:
  - **hisPatients.PatientID** = <123 456 7890>
  - **hisPatients.PID\_VerificationStatus** = *Present and verified*
2. Sets system Patient IDs to the correct format:
 

**patPatients.PatientID** = <123 456 7890>
3. Sets test Patient IDs to the correct format and sets the verification and validation status:
  - **tstPatientDemographics.PatientID** = <123 456 7890>
  - **tstPatientDemographics.PID\_VerificationStatus** = *Present and verified* (if test demographics are complete or test is confirmed)
  - **tstTests.InvalidPID** = *true* (if PID is NHS invalid)
  - **patPatients.PID\_VerificationStatus** = *Present and verified* (if test demographics are complete or test is confirmed)
4. Set Site configuration:
 

Set maximum PID length to a minimum of 12 characters.

### Application

Since updating the data is a potentially long running process, an application was created to display the update status as the data is converted.

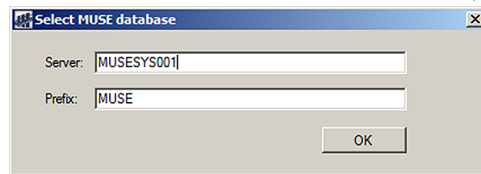
1. Log on to the MUSE application server as MUSE Administrator.
2. *"Schedule a system shutdown."*

3. Insert or mount the MUSE v9 Support media into the optical drive.
4. Copy **\NHS Number Update\NHSNumberUpdate.exe** from the MUSE v9 Support media to the location where the MUSE application is installed.

Default is **C:\Program Files (x86)\MUSE**.

5. Execute **NHSNumberUpdate.exe** from the MUSE application installation folder.

The **Select MUSE database** window opens.



6. In the **Server** field, type the name of the MUSE database server where the MUSE databases reside.

If the databases are installed in a default instance, only the name of the SQL Server is required. If the databases are located on a named instance of SQL Server, include the instance name. For example, if the databases are located on **SQLSERVER1** in a named instance called **MUSE**, type **SQLSERVER1\MUSE**.

7. The **Prefix** field defaults to **MUSE**.

Leave this at default and do not change it unless instructed by Technical Support or Engineering.

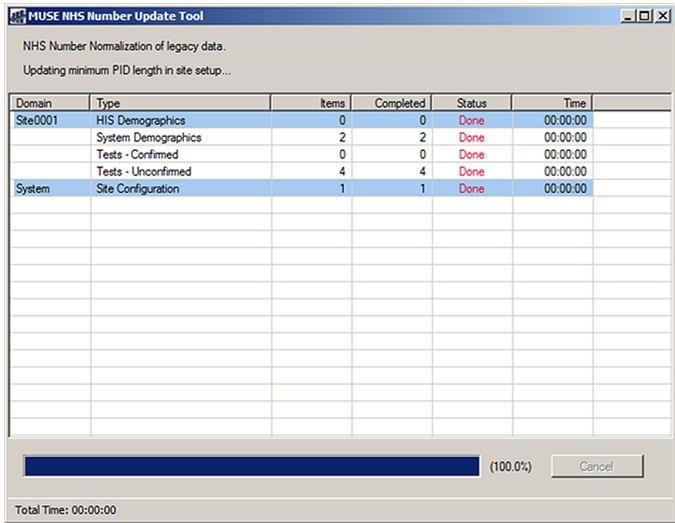
8. Select **OK**.

One of the following occurs:

- a) If the **NHS Number** feature is enabled, the **MUSE NHS Number Update Tool** opens.
- b) If the **NHS Number** feature is not enabled, the following message is displayed: *The NHS Number feature is not currently installed on the MUSE System, so the utility cannot run.*

Select **OK**. Close the tool and enable the **NHS Number** feature using ["Enable NHS Number during Initial MUSE Database Installation" on page 93](#).

9. Select **Start** to begin the conversion process.



A progress bar fills as the conversion executes. When the progress bar is 100 percent, the conversion is complete, the screen displays the total number of items processed, the total number of completed items, and the status of each process. The NHS Number Update Tool log file is **C:\ProgramData\MUSE\MUSE\_NHSNumberUpdate.log**.

- 10. When the conversion is complete, the tool can be closed.
- 11. *"Cancel the system shutdown."*





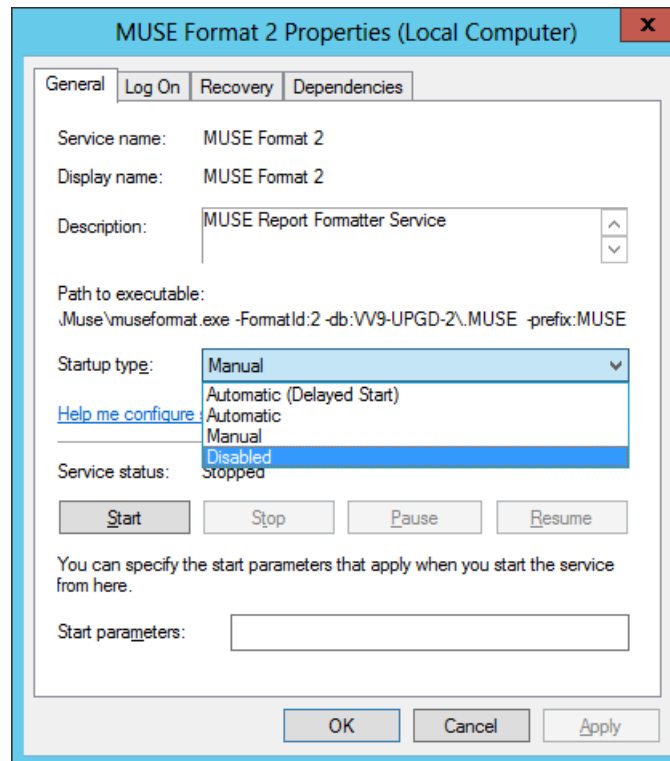
# Support for MARS Holter Reports on MUSE v9 Chinese Simplified Language Systems

**NOTE:**

It is important to implement this configuration on all MUSE v9 systems that are installed with the Chinese Simplified language option.

1. Log on to the MUSE application server using the **MUSE Background** account.
2. Disable the **MUSE Format 2** service, use the following steps:
  - a) Go to **Control Panel > Administrative Tools > Services**.
  - b) Right-click **MUSE Format 2** and select **Properties**.

The **MUSE Format 2 Properties (Local Computer)** window opens.



- c) Select **Stop**.  
The *MUSE Format 2* service stops processing.
  - d) Under **Path to executable**, copy and save the command line arguments starting with **-FormatId:2**.  
For example, **-FormatId:2 -db:VV9-UPGD-2\MUSE -prefix:MUSE**  
You will use this path name later in step "3.c" on page 98.
  - e) From the **Startup type** pull-down menu, select **Disable**.
  - f) Select **OK**.
3. To launch the *museformat.exe* service from the command line, use the following steps:
    - a) Launch the Windows **Command Prompt** (cmd.exe) in administrative mode.  
The **Command Prompt** window opens.
    - b) Navigate to the MUSE installation directory.  
For example, **cd C:\Program Files (x86)\Muse\**.
    - c) Type **MuseFormat.exe** followed by the command line arguments that you copied and saved from the services general properties window.  
For example, **MuseFormat.exe -FormatId:2 -db:VV9-UPGD-2\MUSE -prefix:MUSE**.
    - d) Press **Enter** to launch the service.

Verify that the process has started and displays a message that states that it has started.

```

C:\Program Files (x86)\Muse\museformat.exe -FormatId2 -dbVV9-UPGD-2\MUSE -prefixMUSE
VV9-UPGD-2\MUSE
Running...
Building: System\SystemSettings\General
Building: System\SystemSettings\General
Building: System\SystemSettings\General
Building: System\FixedEnums\EKG
Building: System\FixedEnums\Wires
Building: System\FixedEnums\Wolter
Building: System\FixedEnums\Image
Building: System\FixedEnums\Stress
Building: System\GeneralEnums\General
Building: System\HitTopDictionary\General
Building: System\HitContainer\General
Building: System\PatientContainer\General
Building: System\PatientEnums\General
Building: System\SystemSettings\General
Building: System\TestEventHandlers\General
Building: System\TestMetadata\EKG_Standard
Building: System\TestMetadata\Wires_Standard
Building: System\TestMetadata\Wires_Standard
Building: System\TestMetadata\Wolter_Standard
Building: System\TestMetadata\Image_Standard
Building: System\TestMetadata\Stress_Standard
Building: System\TestMetadata\Stress_Standard
-----
DateTime: 10/6/2016 11:31:47 AM
Severity: Informational
UserID: 2
Status: 0
Module: museformat.exe
Message: Started - Format Service on: (VV9-UPGD-2:8081) DB: (VV9-UPGD-2:MUSE_System)
Trace:
  
```

- e) Minimize the **Command Prompt** window.

Do not log off from the MUSE Application server, or the MUSE Holter formatting service will end.

If your system is using RDP, simply disconnect and allow the *museformat.exe* service to continue running.

**NOTE:**

If for any reason the *museformat.exe* process exits, it will need to be restarted by following step 3 in the instructions above. It will be necessary to follow this process to manually restart the *museformat.exe* process whenever the MUSE application server is rebooted.

Issue	Probable Cause	Resolution
Recently acquired MARS Holter reports are displaying squares instead of the correct Chinese simplified characters in the MUSE editor.	The MUSE Format 2 service is still running as a windows service.	Follow the work instruction. Each Holter test that shows this issue will have to be edited in some fashion and saved, which will cause the report to be re-formatted with the correct characters.
Recently acquired MARS Holter reports that are on the edit list cannot be opened repeatedly with the message that they are currently locked by the Administrator.	The <i>museformat.exe</i> is not running in a console window on the MUSE application server.	Follow the work instruction from step 3.  This will cause each report to be formatted and unlocked.



## Required Network Ports

This guideline includes all required network ports for the MUSE system and some peripheral devices. This is useful for understanding the system's networking requirements and considering either software or hardware firewall configurations. Not all systems use each connection. The ports listed are default values and, in some cases, can be changed.

**Table 17: Network Ports for MUSE Application Server**

<i>Purpose</i>	<i>Port</i>	<i>Type</i>	<i>IN/ OUT</i>	<i>Notes</i>
General acquisition	445	TCP	IN	Required to exchange data via a Windows network share. Also needed for network printing from the MUSE system.
SQL Server	1433	TCP	OUT	MUSE services and <b>SQL Server Management Studio</b> need to be able to communicate directly with the SQL database.
MUSE application	8001, 8002	TCP	IN/ OUT	Default port used by MUSE user interface applications. This port can be changed, but it must be the same port on both the MUSE servers and clients.
HL7 inbound to MUSE	9550	TCP	IN	These ports are used for HL7 inbound to MUSE for ADT and Orders. First HL7 Parser: 9550 Second HL7 Parser: 9551 Third HL7 Parser: 9552 Fourth HL7 Parser: 9553
	9551	TCP	IN	
	9552	TCP	IN	
	9553	TCP	IN	
HL7 outbound from MUSE	Configurable	TCP	OUT	Ports defined in the MUSE HL7 Device configuration. The default starting port is usually 9002.

<i>Purpose</i>	<i>Port</i>	<i>Type</i>	<i>IN/ OUT</i>	<i>Notes</i>
LDAP	389	TCP	OUT	Sends non-encrypted user credentials and group membership.
	636	TCP	OUT	Sends secured user credentials and group membership.
Remote support	443	TCP	OUT	InSite ExC uses this configuration to communicate with GE Healthcare support.
	5900	TCP	IN	InSite ExC uses this configuration to communicate to VNC server for remote sites.
	8011	TCP	IN	InSite ExC uses this configuration to communicate to internal-only ports.
	8081	TCP	IN	
Network printing	9100	TCP	OUT	The default TCP/IP printing port for network printers if the MUSE server is used as a print server.
DCP inbound communication	9240	TCP	IN	<p>Required to receive tests from GE Healthcare ECG devices via the DCP Protocol. Port 9240 is configurable. A Windows firewall exception for the <b>MUSEDCPIn.exe</b> on the system application server makes sure DCP inbound communication is not blocked on Windows operating systems.</p> <p>The IGMP OUT port is enabled by default on Windows operating systems under the Windows Firewall Outbound Rule named Core Networking – Internet Group Management Protocol (IGMP-Out).</p> <p>The UDP IN/OUT ports are enabled by default in Windows Firewall Rules named Network Discovery (WSD-In) and Network Discovery (WSD-Out).</p>
	N/A	IGMP	OUT	
	3702	UDP	IN/ OUT	
Outbound DCP devices	Configurable	TCP	OUT	Required for outbound DCP Communication with outbound DCP devices.
DICOM Service Class Provider	104	TCP	IN	Default port that the MUSE application uses to receive DICOM tests. Configurable within the MUSE application.

## Required Network Ports

<i>Purpose</i>	<i>Port</i>	<i>Type</i>	<i>IN/ OUT</i>	<i>Notes</i>
DICOM Service Class User	Configurable	TCP	OUT	Default port that the MUSE application uses to send DICOM tests. Configurable within the MUSE application per device.
DICOM Storage Commitment for Service Class Provider	Configurable	TCP	OUT	Port that the MUSE application uses to send storage commitment responses to DICOM Storage Class Provider when MUSE sends DICOM tests. Configurable within the MUSE application, per device.
DICOM Storage Commitment for Service Class User	105	TCP	IN	Default port that the MUSE application uses to receive storage commitment responses when sending outbound DICOM tests. Configurable within the MUSE application.
DICOM Modality Worklist Service Class User	Configurable	TCP	OUT	Port that the MUSE application uses to communicate with a DICOM Modality Worklist Service Class Provider. Configurable in the MUSE application per MWL SCU.

**Table 18: Network Ports for Windows IIS Server (Web Server)**

<i>Purpose</i>	<i>Port</i>	<i>Type</i>	<i>IN/ OUT</i>	<i>Notes</i>
HTTP	80	TCP	IN/ OUT	Ports that connect the MUSE system to the MUSE web API and web UI.
HTTPS	443	TCP	IN/ OUT	

**Table 19: Network Ports for the MUSE Modem Server(s)**

If the MUSE modems are configured on the MUSE application server or the MUSE client, the client or server is also a MUSE modem server.

<i>Purpose</i>	<i>Port</i>	<i>Type</i>	<i>IN/ OUT</i>	<i>Notes</i>
CSI network	Configurable	TCP	OUT	The port that the MUSE modem server connects to for each ECG device. This can be a range of ports, starting at 3001, or the same port number for each ECG device.
SQL Server	1433	TCP	OUT	MUSE modem server(s) need to communicate directly with the SQL database.

**Table 20: Network Ports for MUSE Database Server**

If the SQL database is located on the MUSE application server, it is also the MUSE database server.

<i>Purpose</i>	<i>Port</i>	<i>Type</i>	<i>IN/ OUT</i>	<i>Notes</i>
SQL Server	1433	TCP	IN	Listens for incoming connections and allows administrators to check the status of SQL databases. The incoming connections can be changed.
	1434	UDP	IN	Used by SQL browser service.

**Table 21: Network Ports for MUSE Client Workstation(s)**

<i>Purpose</i>	<i>Port</i>	<i>Type</i>	<i>IN/ OUT</i>	<i>Notes</i>
MUSE application	8001, 8002	TCP	OUT	Default port used by MUSE user interface applications. You can change this port, but it must be the same on both the MUSE servers and clients.
SQL Server	1433	TCP	OUT	MUSE and MUSE Modem Services need to be able to communicate directly with the SQL database. This is not applicable if the modem feature is not installed.
MUSE modem feature and network printing	445	TCP	IN	Needed to allow the MUSE application server to communicate with the MUSE modem service on the MUSE client, or for network printing if a printer is shared on the MUSE client. This is not applicable if the MUSE modem service is not installed or if no printers are shared on the MUSE client.

**Table 22: Network Ports for MUSE HL7 Interface (includes CCG)**

<i>Purpose</i>	<i>Port</i>	<i>Type</i>	<i>IN/ OUT</i>	<i>Notes</i>
Webmin	10000	TCP	IN	Used for web browser access to Webmin.
HL7 communications	Configurable	TCP	IN/ OUT	Ports defined in CCG configuration.

**Table 23: Network Ports for MUSE Monitoring Gateway**

<i>Purpose</i>	<i>Port</i>	<i>Type</i>	<i>IN/ OUT</i>	<i>Notes</i>
General acquisition	445	UDP	IN	Required to exchange data via a Windows network share with the MUSE application. It is also needed for network printing from the MUSE application.
Monitoring acquisition	69	UDP	IN	Required for TFTP to receive data from monitors.
RWHAT communication	7000	UDP	IN/ OUT	Required for communication with bedside monitors.





## Related Documents

The following documents provide additional information that can be helpful in the planning, installation, configuration, maintenance, and use of this system.

<b>Part Number</b>	<b>Document Title</b>
2056246-002	<i>MUSE NX Cardiology Information System 12SL Physician's Guide</i>
2059568-023	<i>DICOM Conformance Statement for MUSE and MUSE DICOM Gateway Pro</i>
2102027-001	<i>MUSE NX Cardiology Information System User Manual</i>
2102027-002	<i>MUSE NX Cardiology Information System User Manual – Web Client</i>
2102027-003	<i>MUSE NX Cardiology Information System Regulatory and Safety Manual</i>
2102027-004	<i>MUSE NX Cardiology Information System Pre-Installation Guide</i>
2102027-005	<i>MUSE NX Cardiology Information System Administrator's Guide</i>
2102027-006	<i>MUSE NX Cardiology Information System Service Manual</i>
2102027-007	<i>MUSE NX Cardiology Information System Installation and Upgrade Manual</i>
2102027-008	<i>MUSE NX Cardiology Information System Centricity Clinical Gateway (CCG) Manual</i>
2102027-009	<i>MUSE NX Cardiology Information System Enterprise Integration Manual</i>
2102027-010	<i>MUSE NX Cardiology Information System Devices and Interfaces Instruction Manual</i>
2102027-014	<i>MUSE NX Cardiology Information System Privacy and Security Guide</i>
2102027-016	<i>MUSE NX Cardiology Information System eDoc Connect Installation Manual</i>
2102027-226	<i>MUSE NX Cardiology Information System Monitoring Gateway Software Installation</i>
2102027-227	<i>MUSE NX Cardiology Information System HL7 Interface Reference Manual</i>
2102027-228	<i>MUSE NX Cardiology Information System XML Manual</i>

## Related Documents

<i>Part Number</i>	<i>Document Title</i>
2102027-300	<i>MUSE NX Cardiology Information System Interval Editor Manual</i>



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