

GE Healthcare

# Xtream Injector Option Installation Manual



OPERATING DOCUMENTATION

5317408-1EN

Rev 9

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# **LEGAL NOTES**

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# IMPORTANT PRECAUTIONS

## LANGUAGE

<p><b>ПРЕДУПРЕЖДЕНИЕ</b> (BG)</p>	<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 пациента в резултат на токов удар, механична или друга опасност.</li> </ul>
<p><b>警告</b> (ZH-CN)</p>	<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>
<p><b>警告</b> (ZH-HK)</p>	<p>本服務手冊僅提供英文版本。</p> <ul style="list-style-type: none"> <li>• 倘若客戶的服務供應商需要英文以外之服務手冊，客戶有責任提供翻譯服務。</li> <li>• 除非已參閱本服務手冊及明白其內容，否則切勿嘗試維修設備。</li> <li>• 不遵從本警告或會令服務供應商、網絡供應商或病人受到觸電、機械性或其他危險。</li> </ul>
<p><b>警告</b> (ZH-TW)</p>	<p>本維修手冊僅有英文版。</p> <ul style="list-style-type: none"> <li>• 若客戶的維修廠商需要英文版以外的語言，應由客戶自行提供翻譯服務。</li> <li>• 請勿試圖維修本設備，除非 您已查閱並瞭解本維修手冊。</li> <li>• 若未留意本警告，可能導致維修廠商、操作員或病患因觸電、機械或其他危險而受傷。</li> </ul>
<p><b>UPOZORENJE</b> (HR)</p>	<p>Ovaj servisni priručnik dostupan je na engleskom jeziku.</p> <ul style="list-style-type: none"> <li>• Ako davatelj usluge klijenta treba neki drugi jezik, klijent je dužan osigurati prijevod.</li> <li>• Ne pokušavajte servisirati opremu ako niste u potpunosti pročitali i razumjeli ovaj servisni priručnik.</li> <li>• Zanimarite li ovo upozorenje, može doći do ozljede davatelja usluge, operatera ili pacijenta uslijed strujnog udara, mehaničkih ili drugih rizika.</li> </ul>
<p><b>VÝSTRAHA</b> (CS)</p>	<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 výstrahy může dojít k poranění pracovníka prodejního servisu, obslužného personálu nebo pacientů vlivem elektrického proudu, respektive vlivem mechanických či jiných rizik.</li> </ul>

<b>ADVARSEL</b> (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 uden at læse og forstå denne servicemanual.</li><li>• Manglende overholdelse af denne advarsel kan medføre skade på grund af elektrisk stød, mekanisk eller anden fare for teknikeren, operatøren eller patienten.</li></ul>
<b>WAARSCHUWING</b> (NL)	<p>Deze onderhoudshandleiding is enkel in het Engels verkrijgbaar.</p> <ul style="list-style-type: none"><li>• Als het onderhoudspersoneel een andere taal vereist, dan is de klant verantwoordelijk voor de vertaling ervan.</li><li>• Probeer de apparatuur niet te onderhouden alvorens deze onderhoudshandleiding werd geraadpleegd en begrepen is.</li><li>• Indien deze waarschuwing niet wordt opgevolgd, zou het onderhoudspersoneel, de operator of een patiënt gewond kunnen raken als gevolg van een elektrische schok, mechanische of andere gevaren.</li></ul>
<b>WARNING</b> (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>
<b>HOIATUS</b> (ET)	<p>See 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>
<b>VAROITUS</b> (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>
<b>ATTENTION</b> (FR)	<p>Ce manuel d'installation et de maintenance est disponible uniquement en anglais.</p> <ul style="list-style-type: none"><li>• Si le technicien d'un client a besoin de ce manuel dans une langue autre que l'anglais, il incombe au client de le faire traduire.</li><li>• Ne pas tenter d'intervenir sur les équipements tant que ce manuel d'installation et de maintenance 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>

<p><b>WARNUNG</b> (DE)</p>	<p>Diese Serviceanleitung existiert nur in englischer Sprache.</p> <ul style="list-style-type: none"> <li>• Falls ein fremder Kundendienst eine andere Sprache benötigt, ist es Aufgabe des Kunden für eine entsprechende Übersetzung zu sorgen.</li> <li>• Versuchen Sie nicht diese Anlage zu warten, ohne diese Serviceanleitung gelesen und verstanden zu haben.</li> <li>• Wird diese Warnung nicht beachtet, so kann es zu Verletzungen des Kundendiensttechnikers, des Bedieners oder des Patienten durch Stromschläge, mechanische oder sonstige Gefahren kommen.</li> </ul>
<p><b>ΠΡΟΕΙΔΟΠΟΙΗΣΗ</b> (EL)</p>	<p>Το παρόν εγχειρίδιο σέρβις διατίθεται μόνο στα αγγλικά.</p> <ul style="list-style-type: none"> <li>• Εάν ο τεχνικός σέρβις ενός πελάτη απαιτεί το παρόν εγχειρίδιο σε γλώσσα εκτός των αγγλικών, αποτελεί ευθύνη του πελάτη να παρέχει τις υπηρεσίες μετάφρασης.</li> <li>• Μην επιχειρήσετε την εκτέλεση εργασιών σέρβις στον εξοπλισμό αν δεν έχετε συμβουλευτεί και κατανοήσει το παρόν εγχειρίδιο σέρβις.</li> <li>• Αν δεν προσέξετε την προειδοποίηση αυτή, ενδέχεται να προκληθεί τραυματισμός στον τεχνικό σέρβις, στο χειριστή ή στον ασθενή από ηλεκτροπληξία, μηχανικούς ή άλλους κινδύνους.</li> </ul>
<p><b>FIGYELMEZTETÉS</b> (HU)</p>	<p>Ezen karbantartási kézikönyv kizárólag angol nyelven érhető el.</p> <ul style="list-style-type: none"> <li>• Ha a vevő szolgáltatója angoltól eltérő nyelvre tart igényt, akkor a vevő felelőssége a fordítás elkészítése.</li> <li>• Ne próbálja elkezdni használni a berendezést, amíg a karbantartási kézikönyvben leírtakat nem értelmezték.</li> <li>• Ezen figyelmeztetés figyelmen kívül hagyása a szolgáltató, működtető vagy a beteg áramütés, mechanikai vagy egyéb veszélyhelyzet miatti sérülését eredményezheti.</li> </ul>
<p><b>AÐVÖRUN</b> (IS)</p>	<p>Þessi þjónustuhandbók er aðeins fáanleg á ensku.</p> <ul style="list-style-type: none"> <li>• Ef að þjónustuveitandi viðskiptamanns þarfnast annas tungumáls en ensku, er það skylda viðskiptamanns að skaffa tungumálþjónustu.</li> <li>• Reynið ekki að afgreiða tækið nema að þessi þjónustuhandbók hefur verið skoðuð og skilin.</li> <li>• Brot á sinna þessari aðvörun getur leitt til meiðsla á þjónustuveitanda, stjórnanda eða sjúklings frá raflosti, vélrænu eða öðrum áhættum.</li> </ul>
<p><b>AVVERTENZA</b> (IT)</p>	<p>Il presente manuale di manutenzione è disponibile soltanto in lingua 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>• Procedere alla manutenzione dell'apparecchiatura solo dopo aver consultato il presente manuale ed averne compreso il contenuto.</li> <li>• Il mancato rispetto della presente avvertenza potrebbe causare lesioni all'addetto alla manutenzione, all'operatore o ai pazienti provocate da scosse elettriche, urti meccanici o altri rischi.</li> </ul>
<p><b>警告</b> (JA)</p>	<p>このサービスマニュアルに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理解せずに、装置のサービスを行わないでください。</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さんが、感電や機械的又はその他の危険により負傷する可能性があります。</li> </ul>



<b>ATENÇÃO</b> (PT-PT)	<p>Este manual de assistência técnica só se encontra disponível em inglês.</p> <ul style="list-style-type: none"><li>• Se qualquer outro serviço de assistência técnica solicitar este manual noutra língua, é 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 colocar em perigo a segurança do técnico, do operador ou do paciente devido a choques eléctricos, mecânicos ou outros.</li></ul>
<b>ATENȚIE</b> (RO)	<p>Acest manual de service este disponibil doar 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>
<b>ОСТОРОЖНО!</b> (RU)	<p>Данное руководство по техническому обслуживанию представлено 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 самостоятельно обеспечить перевод.</li><li>• Перед техническим обслуживанием оборудования обязательно обратитесь к данному руководству и поймите изложенные в нем сведения.</li><li>• Несоблюдение требований данного предупреждения может привести к тому, что специалист по техобслуживанию, оператор или пациент получит удар электрическим током, механическую травму или другое повреждение.</li></ul>
<b>UPOZORENJE</b> (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>• Ne pokušavajte da opravite uređaj ako niste pročitali i razumeli ovo servisno uputstvo.</li></ul>
<b>UPOZORNENIE</b> (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, kým si neprečítate návod na obsluhu a neporozumiete mu.</li><li>• Zanedbanie tohto upozornenia môže spôsobiť zranenie poskytovateľa služieb, obsluhujúcej osoby alebo pacienta elektrickým prúdom, mechanické alebo iné ohrozenie.</li></ul>

<b>ATENCIÓN</b> (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>
<b>VARNING</b> (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>
<b>OPOZORILO</b> (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>
<b>DİKKAT</b> (TR)	<p>Bu servis kılavuzunun sadece ingilizcesi mevcuttur.</p> <ul style="list-style-type: none"><li>• Eğer müşteri teknisyeni bu kılavuzu ingilizce dışında bir başka lisandan talep ederse, bunu tercüme ettirmek müşteriye düşer.</li><li>• Servis kılavuzunu okuyup anlamadan ekipmanlara müdahale etmeyiniz.</li><li>• Bu uyarıya uyulmaması, elektrik, mekanik veya diğer tehlikelerden dolayı teknisyen, operatör veya hastanın yaralanmasına yol açabilir.</li></ul>

## **DAMAGE IN TRANSPORTATION**

All packages should be closely examined at time of delivery. If damage is apparent, have notation "damage in shipment" written on all copies of the freight or express bill before delivery is accepted or "signed for" by a General Electric representative or a hospital receiving agent. Whether noted or concealed, damage MUST be reported to the carrier immediately upon discovery, or in any event, within 14 days after receipt, and the contents and containers held for inspection by the carrier. A transportation company will not pay a claim for damage if an inspection is not requested within this 14 day period.

To file a report:

- Call 1-800-548-3366 and use option 8.
- Fill out a report on <http://us44hdd21/sctq/InstallFulfill/InstalFulfillment.htm>
- Contact your local service coordinator for more information on this process.

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## **CERTIFIED ELECTRICAL CONTRACTOR STATEMENT**

All electrical Installations that are preliminary to positioning of the equipment at the site prepared for the equipment shall be performed by licensed electrical contractors. In addition, electrical feeds into the Power Distribution Unit shall be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations and testing shall be performed by qualified GE Medical personnel. The products involved (and the accompanying electrical installations) are highly sophisticated, and special engineering competence is required. In performing all electrical work on these products, GE will use its own specially trained field engineers. All of GE's electrical work on these products will comply with the requirements of the applicable electrical codes.

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

## **IMPORTANT...X-RAY PROTECTION**

X-ray equipment if not properly used may cause injury. Accordingly, the instructions herein contained should be thoroughly read and understood by everyone who will use the equipment before you attempt to place this equipment in operation. The General Electric Company, Medical Systems Group, will be glad to assist and cooperate in placing this equipment in use.

Although this apparatus incorporates a high degree of protection against x-radiation other than the useful beam, no practical design of equipment can provide complete protection. Nor can any practical design compel the operator to take adequate precautions to prevent the possibility of any persons carelessly exposing themselves or others to radiation.

It is important that anyone having anything to do with x-radiation be properly trained and fully acquainted with the recommendations of the National Council on Radiation Protection and Measurements as published in NCRP Reports available from NCRP Publications, 7910 Woodmont Avenue, Room 1016, Bethesda, Maryland 20814, and of the International Commission on Radiation Protection, and take adequate steps to protect against injury.

The equipment is sold with the understanding that the General Electric Company, Medical Systems Group, its agents, and representatives have no responsibility for injury or damage which may result from improper use of the equipment.

Various protective materials and devices are available. It is urged that such materials or devices be used.

## LITHIUM BATTERY CAUTIONARY STATEMENTS

### CAUTION



**Risk of Explosion.**

**Danger of explosion if battery is incorrectly replaced.**

**Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.**

### ATTENTION



**Danger d'Explosion**

**Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.**

**Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.**

## OMISSIONS & ERRORS

Customers, please contact your GE Sales or Service representatives.

GE personnel, please use the Healthcare PQR Process to report all omissions, errors, and defects in this publication.

# Revision History

Revision	Date	Reason for change
9	April 16, 2019	Added information Medtron Injector
8	November 30, 2015	Added information of E-Box Option.
7	September 17, 2014	Added urlich injector information. Updated Medrad interconnect information.
6	May 17, 2012	Added Brivo CT information.
5	October 24, 2011	Updated Table 1-1 (CiA425 Compliant Injector certified)
4	May 16, 2011	RoHS Flag conversion
3	05/18/10	Added Medrad information
2	03/24/09	Updated Section 1.0, 2.0, 3.0 and 6.0
1	08/28/08	Initial Release



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# List of Effected Pages

---

PAGES	REVISION	PAGES	REVISION	PAGES	REVISION
1 through 44	9				



# Table of Contents

## Preface

**Publication Conventions ..... 19**

### Section 1.0

**Safety & Hazard Information ..... 19**

1.1 Text and Character Representation..... 19  
1.2 Graphical Representation ..... 20

### Section 2.0

**Publication Conventions ..... 21**

2.1 General Paragraph and Character Styles..... 21  
2.2 Page Layout..... 21  
2.3 Computer Screen Output/Input Text Character Styles ..... 22  
2.4 Buttons, Switches and Keyboard Inputs (Hard & Soft Keys)..... 22

## Chapter 1

**Xtream Injector Option Installation ..... 23**

### Section 1.0

**Introduction ..... 23**

1.1 Overview..... 23  
1.2 Prerequisites..... 23

### Section 2.0

**Material List ..... 24**

### Section 3.0

**Interconnect Diagram ..... 25**

3.1 Nemoto Injector ..... 25  
3.2 MEDRAD Injector ..... 26  
3.3 Ulrich Injector..... 28  
3.4 Medtron Injector..... 29

### Section 4.0

**Installation Procedure..... 30**

4.1 Install Injector..... 30  
4.2 Install cables between CT and Injector ..... 30  
    4.2.1 Preparation ..... 30  
        4.2.1.1 Cover Removal (except for Brivo CT) ..... 30  
        4.2.1.2 Cover Removal for Brivo CT ..... 31  
    4.2.2 Install Cables ..... 31  
4.3 Restore Power to the Gantry ..... 32  
4.4 Install Option Software Key ..... 32

### Section 5.0

**Functional Test..... 33**

5.1 Verify Connection between CT and Injector ..... 33  
5.2 Functional Test for Xtream Injector Option ..... 33  
5.3 Functional Test for Enhanced Xtream Injector Option..... 36

---

<b>Section 6.0</b>	
<b>System Level Safety Test.....</b>	<b>39</b>
<b>Section 7.0</b>	
<b>Finish Installation .....</b>	<b>39</b>
7.1 Process Product Locator Card .....	39
<b>Chapter A</b>	
<b>Injector Status Buttons .....</b>	<b>41</b>
1.1 Xtream Injector Status Icons .....	41
1.2 Enhanced Xtream Injector Status Icons .....	42

# Preface

## Publication Conventions

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Purpose: Standardize conventions for representing information in a uniform way of communicating information to a reader in a consistent manner. Conventions are used so that the reader can easily recognize the actions or decisions that must be made. There are a number of character and paragraph styles used in this publication to accomplish this task. Please become familiar with them before proceeding forward.

## Section 1.0

### Safety & Hazard Information

#### 1.1 Text and Character Representation

Within this publication, different paragraph and character styles have been used to indicate potential hazards. Paragraph prefixes, such as hazard, caution, danger and warning, are used to identify important safety information. Text (Hazard) styles are applied to the paragraph contents that is applicable to each specific safety statement. Words describe the type of potential hazard that may be encountered and are placed immediately before the paragraph it modifies. Safety information will normally include:

- Type of potential Hazard
- Nature of potential injury
- Causative condition
- How to avoid or correct the causative condition

#### EXAMPLES OF HAZARD STATEMENTS USED

It's important that you read and understand hazard statements, and not just ignore them.



**DANGER  
SEVERE  
PERSONAL  
INJURY**

**DANGER IS USED WHEN A HAZARD EXISTS WHICH WILL CAUSE SEVERE PERSONAL INJURY OR DEATH IF INSTRUCTIONS ARE IGNORED. THEY CAN INCLUDE:**


- **ELECTROCUTION**
- **CRUSHING**
- **RADIATION**




**WARNING  
SERIOUS  
PERSONAL  
INJURY**

**WARNING IS USED WHEN A HAZARD EXISTS WHICH COULD OR CAN CAUSE SERIOUS PERSONAL INJURY OR DEATH IF INSTRUCTIONS ARE IGNORED. THEY CAN INCLUDE:**

- **POTENTIAL FOR SHOCK**
- **EXPOSED WIRES**
- **FAILURE TO TAG AND LOCKOUT SYSTEM POWER COULD ALLOW FOR UN-COMMANDED MOTION.**


 **CAUTION**  
**Minor Personal Injury**  
Caution is used when a hazard exists which can or could cause minor injury to self or others if instructions are ignored. They include for example:










- Loss of critical patient data
- Crush or pinch points
- Sharp objects

 **NOTICE**  
**Property Damage Only**  
Notice is used when a hazard is present that can cause property damage but has absolutely no personal injury risk. They can include:

- Disk drive will be destroyed
- Internal mechanical damage, such as to the x-ray tube
- Coasting the rotor through resonance.

## 1.2 Graphical Representation

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

<p><b>ELECTRICAL</b></p>  <p><b>LASER</b></p>  <p><b>LASER LIGHT</b></p>	<p><b>HAZARDS MECHANICAL</b></p>  <p><b>HEAT</b></p> 	<p><b>RADIATION</b></p>  <p><b>PINCH</b></p> 
<p><b>AVOID STATIC ELECTRICITY</b></p> 	<p><b>PROCEDURAL TAG AND LOCK OUT</b></p> 	<p><b>WEAR EYE PROTECTION</b></p>  <p><b>EYE PROTECTION</b></p>

# Section 2.0 Publication Conventions

## 2.1 General Paragraph and Character Styles

Prefixes are used to highlight important non-safety related information. Paragraph prefixes (such as purpose, example, comment or note) are used to identify important but non-safety related information. Text styles are also applied to text within each paragraph modified by the specific prefix.

### EXAMPLES OF PREFIXES USED FOR GENERAL INFORMATION

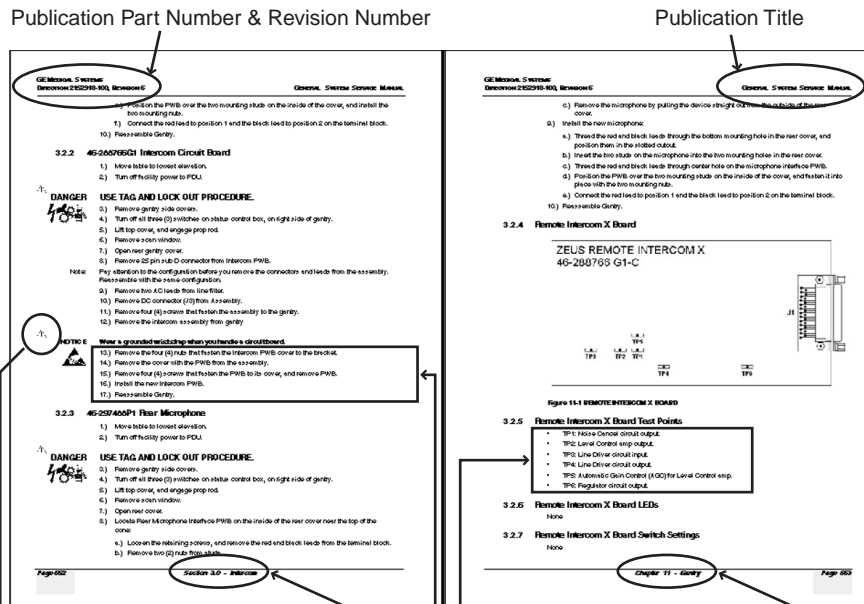
**Purpose:** Introduces and provides meaning as to the information contained within the chapter, section or subsection, Such as used at the beginning this chapter for example.

**Note:** Conveys information that should be considered important to the reader.

**Example:** Used to make the reader aware that the paragraph(s) that follow are examples of information possibly stated previously.

**Comment:** Represents "additional" information that may or may not be relevant to your situation.

## 2.2 Page Layout



The current section and its title are always shown in the footer of the left (even) page.

An exclamation point in a triangle is used to indicate important information to the user.

Paragraphs preceded by **Alphanumeric** characters (e.g. numbers) contain information that must be followed in a **specific order**.

The current chapter and its title are always shown in the footer of the right (odd) page.

Paragraphs preceded by a **symbol** (e.g. bullets) contain information that has **no specific order**.

Headers and footers in this publication are designed to allow you to quickly identify your location. The document's part number and revision number appears in every header on every page. Odd

numbered page footers indicate the current chapter, its title and current page number. Even page footers show the current section and its title, as well current page number.

## 2.3 Computer Screen Output/Input Text Character Styles

Within this publication, mono-spaced character styles (fonts) are used to indicate computer text that's either screen input and output. Mono spaced fonts, such as courier, are used to indicate text direction. When you type at your keyboard, you are generating computer input. Occasionally you will see the math operators "greater than" and "less than" symbols used to indicate the start and finish of variable output. When reading text generated by the computer, you are reading it as computer generated output. In addition to direction, characters are italicized (e.g. *italics*) to indicate information specific to your system or site.

Example:  
Fixed Output

This paragraph's fonts represents computer generated screen "fixed" output. It's output is fixed from the sense that it does not vary from application to application. It's the most commonly used style used to indicate filenames, paths and text that does not change from system to system. The character style used is a fixed width such as courier.

Example:  
Variable Output

*This paragraph's font represents computer screen output that is "variable". Its used to represent output that varies from application to application or system to system. Variable output is sometimes found placed between greater than and lesser than operators for clarification. For example: <variable\_ouput> or <3.45.120.3>. In both cases, the < and > operators are not part of the actual input.*

Example:  
Fixed Input

**This paragraph's font represents fixed input. It's computer input that is typed-in via the keyboard. Typed input that does not vary from application to application or system to system. Fixed text the user is required to supply as input. For example: cd /usr/3p**

Example:  
Variable Input

***This paragraph's font represents computer input that can vary from application to application or system to system. With variable text, the user is required to supply system dependent input or information. Variable input sometimes is placed between greater-than and less-than operators. For example: <variable\_input>. In these cases, the (<>) operators would be dropped prior to input. For example: ypcat hosts | grep <3.45.120.3> would be typed into the computer as ypcat hosts | grep 3.45.120.3 without the greater-than and less-than operators.***

## 2.4 Buttons, Switches and Keyboard Inputs (Hard & Soft Keys)

Different character styles are used to indicate actions requiring the reader to press either a hard or soft button, switch or key. Physical hardware, such as buttons and switches, are called hard keys because they are hard wired or mechanical in nature. A keyboard or on/off switch would be a hard key. Software or computer generated buttons are called soft keys because they are software generated. Software driven menu buttons are an example of such keys. Soft and hard keys are represented differently in this publication.

Example:  
Hard Keys

A power switch **ON/OFF** or a keyboard key like **ENTER** is indicated by applying a character style that uses both over and under-lined bold text that is bold. This is a hard key.

Example:  
Soft Keys

Whereas the computer MENU button that you would click with your mouse or touch with your hand uses over and under-lined regular text. This is a soft key.

**END OF SECTION**

# Chapter 1

## Xtream Injector Option Installation

### Section 1.0 Introduction

#### 1.1 Overview

The Xtream Injector is a start synchronization of CT scanner and Injector. Pressing the Start Scan button makes the scan and injector start simultaneously. This feature is only available with the injector, which supports CANopen Injector Interface Standard (CiA425) and is verified by GEHC.

There are 2 classes in Xtream Injector.

- Xtream Injector, which is the same as Class1 in CiA425, allows only ON/OFF.
- Enhanced Xtream Injector, which is the same as Class4 in CiA425, allows ON/OFF and injector parameters setting from the CT scanner.

CT scanner and injector are operated independently after start of scanning.

#### 1.2 Prerequisites

The following hardware must be installed prior to this option installation.

- Gantry I/F Panels with IPC (Integrated Peripheral Control) board
- CiA425 Compliant Injector certified by GEHC (see [Table 1-1](#))

Type (Continued)	Manufacturer/Model (Continued)
Patient contrast injector: For Xtream Injector option	Nemoto Dual Shot Alpha (CiA425 Class I) / GE 5328194 Nemoto Dual Shot Alpha (CiA425 Class IV) / GE 5328195 Nemoto Dual Shot Alpha 7 (CiA425 Class IV) Nemoto Dual Shot GX (CiA425 Class IV) Nemoto Dual Shot GX 7(CiA425 Class IV) Nemoto A-800 (CiA425 Class IV) / GE 5421942 Nemoto W1000 (CiA425 Class IV) Medrad ISI900 (for Stellant D) (CiA 425 Class IV)/GE 5335919 ulrich ohio M (XD2004) (CiA425 Class I) ulrich CT motion (XD8000) (CiA425 Class I)
Patient contrast injector: For Enhanced Xtream Injector option	Nemoto Dual Shot Alpha (CiA425 Class IV) / GE 5328195 Nemoto Dual Shot Alpha 7 (CiA425 Class IV) Nemoto Dual Shot GX (CiA425 Class IV) Nemoto Dual Shot GX 7(CiA425 Class IV) Nemoto A-800 (CiA425 Class IV) / GE 5421942 Nemoto W1000 (CiA425 Class IV) Medrad ISI900 (for Stellant D) (CiA 425 Class IV)/GE 5335919 ulrich CT motion (XD8000) (CiA425 Class IV) Medtron Accutron CT-D (CiA425 Class IV)

Table 1-1 CiA425 Compliant Injector certified by GEHC (as of April, 2019)

- Note:
- For compatibility information with CT system, refer to the Technical Reference Manual of your product.
  - MEDRAD provides an option to upgrade from previously installed injector to integrated version. Installation of additional hardware and firmware upgrade of injector must be completed by MEDRAD before installation of this option.
  - It is also recommended that both GE service and Injector vendor to be present for system checkout to confirm the equipment work properly.

## Section 2.0 Material List

Part Number	Quantity	Description
5317258	1.0	Injector Power Cable for Nemoto and Ulrich
5506484	1.0	Injector Power Cable for Medrad and Nemoto /w E-Box
	1.0	Option Key DVD (Xtream Injector or Enhanced Xtream Injector)
5317408-1EN	1.0	Instruction
5169456	1.0	Injector Control Cable

**Note:** For VCT and HD, Injector control cable is included in system cable collector.

**Note:** 5506484 will be included in the option kit after 2H of 2014.

# Section 3.0 Interconnect Diagram

## 3.1 Nemoto Injector

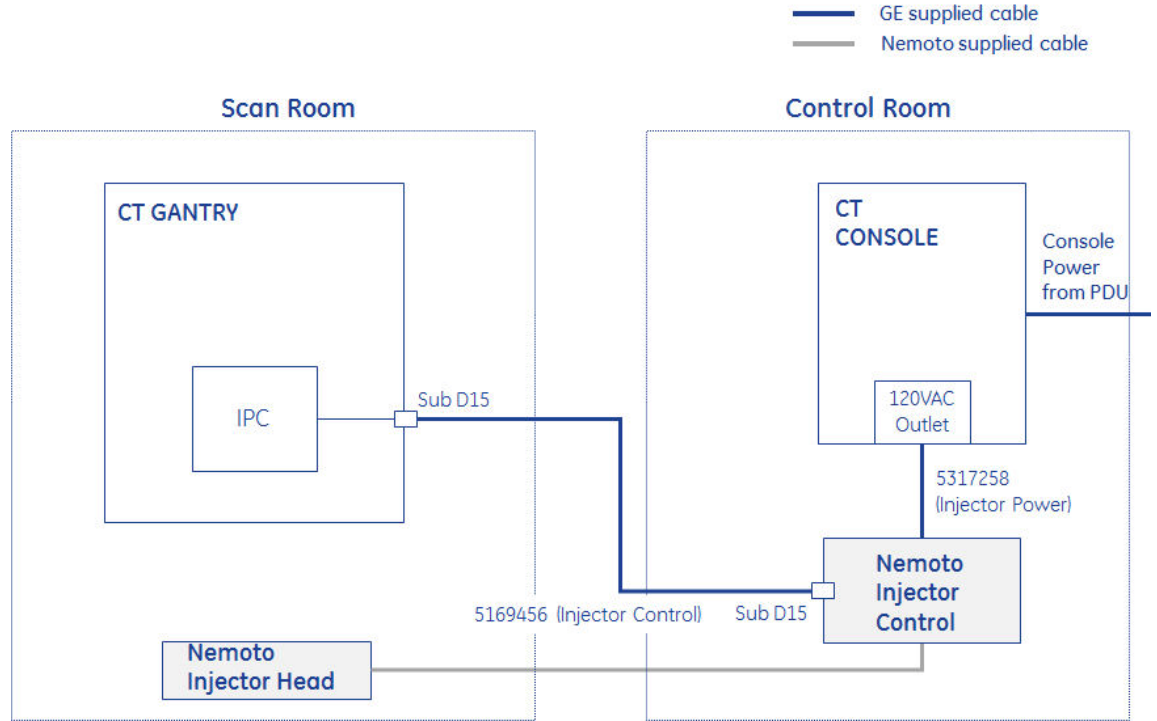
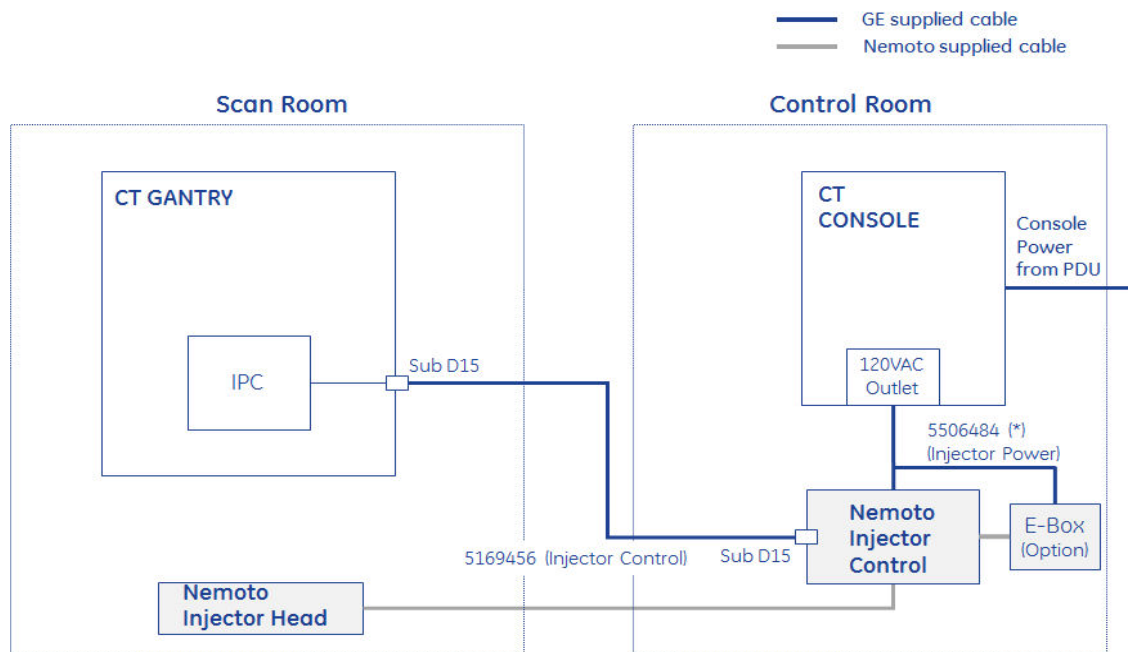


Figure 3-1 Nemoto Interconnect Diagram



(\*) Not use one of the three AC output. Band extra outlet somewhere safely.

Figure 3-2 Nemoto Interconnect Diagram (with E-Box option)

### 3.2 MEDRAD Injector

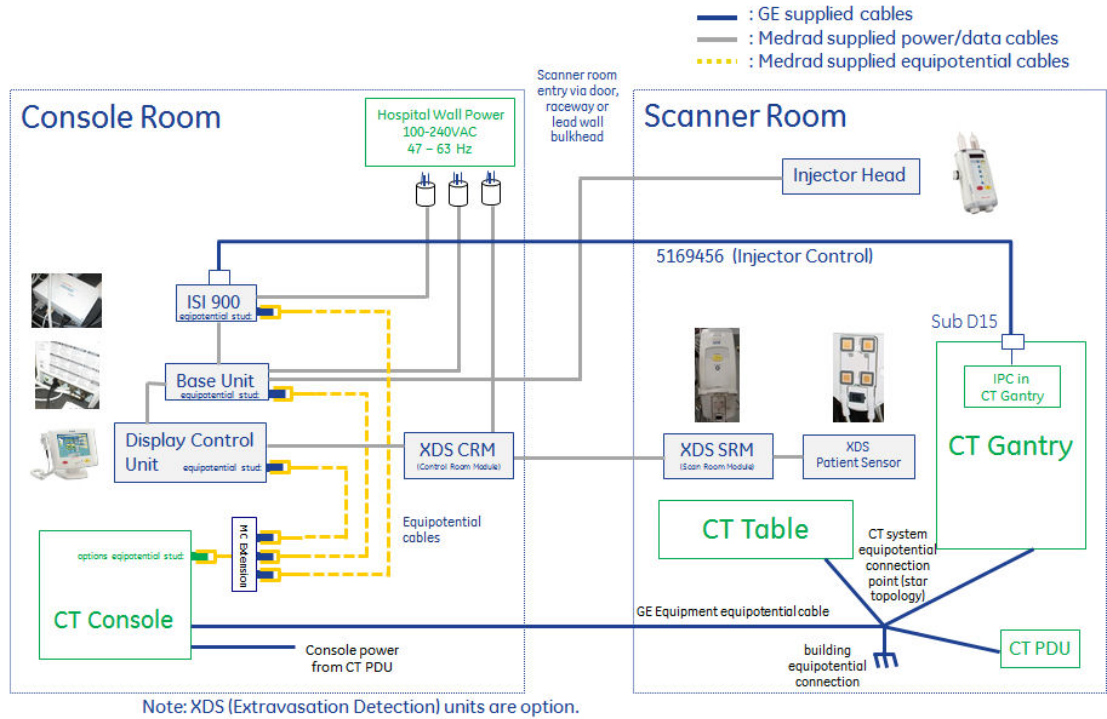


Figure 3-3 Interconnect Diagram (Medrad Stellant D)

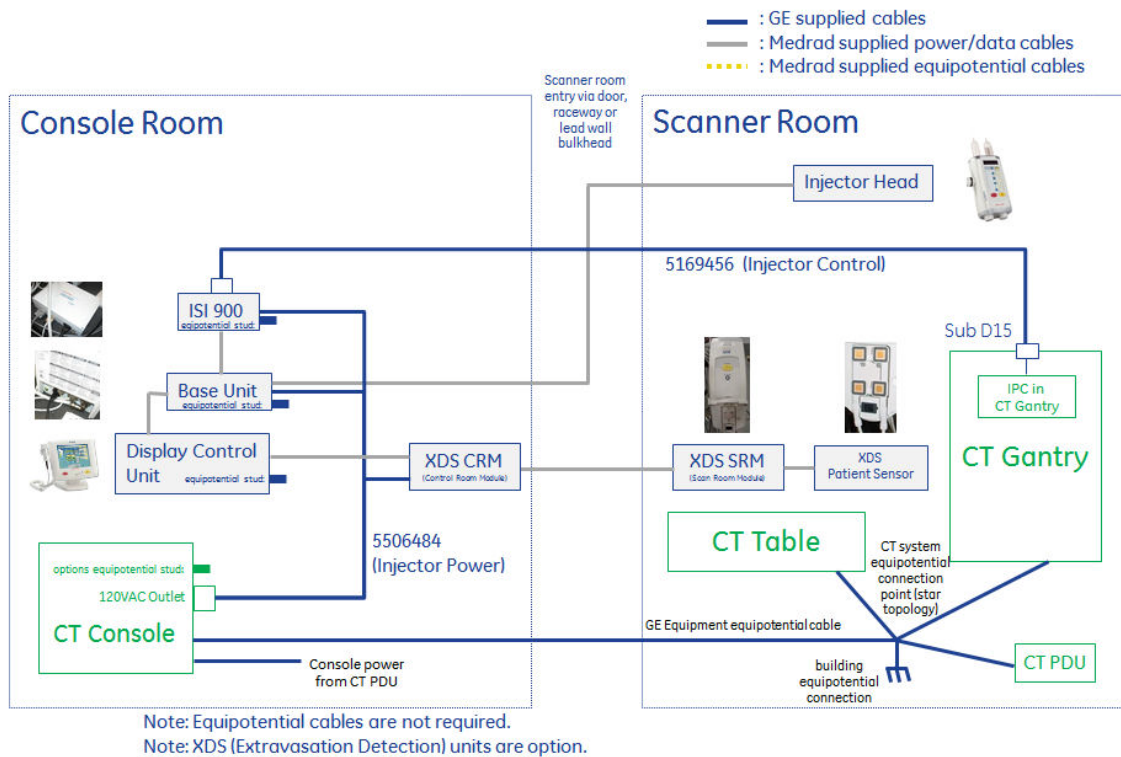
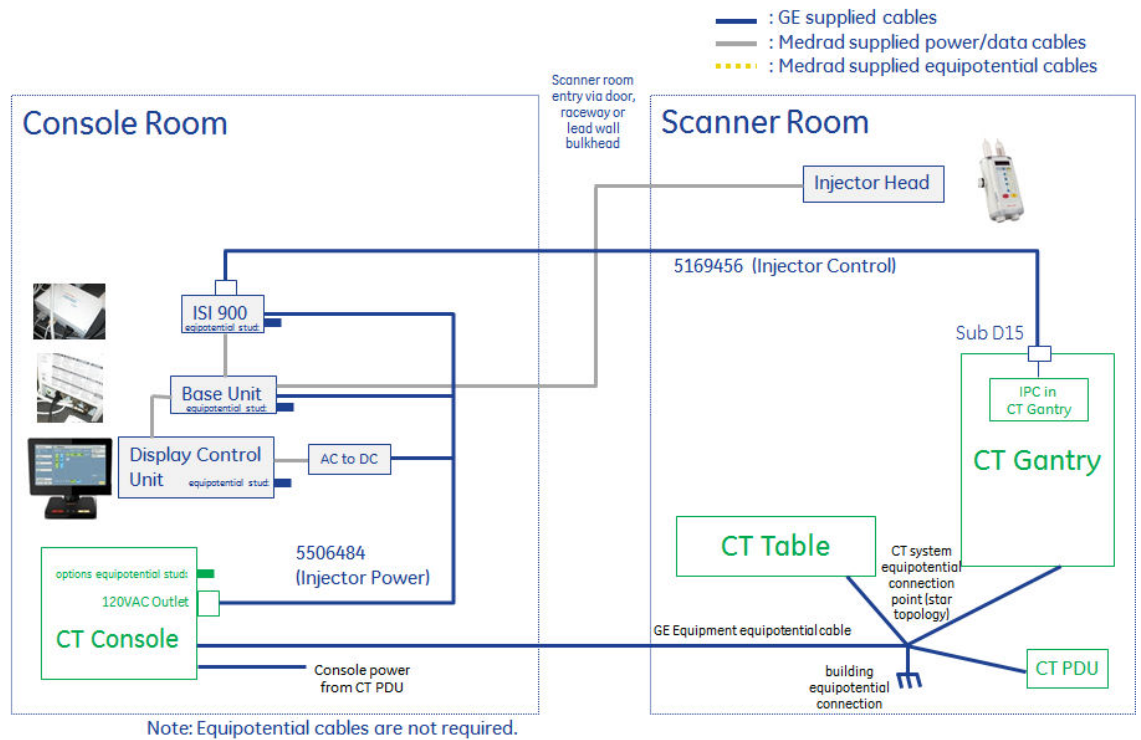
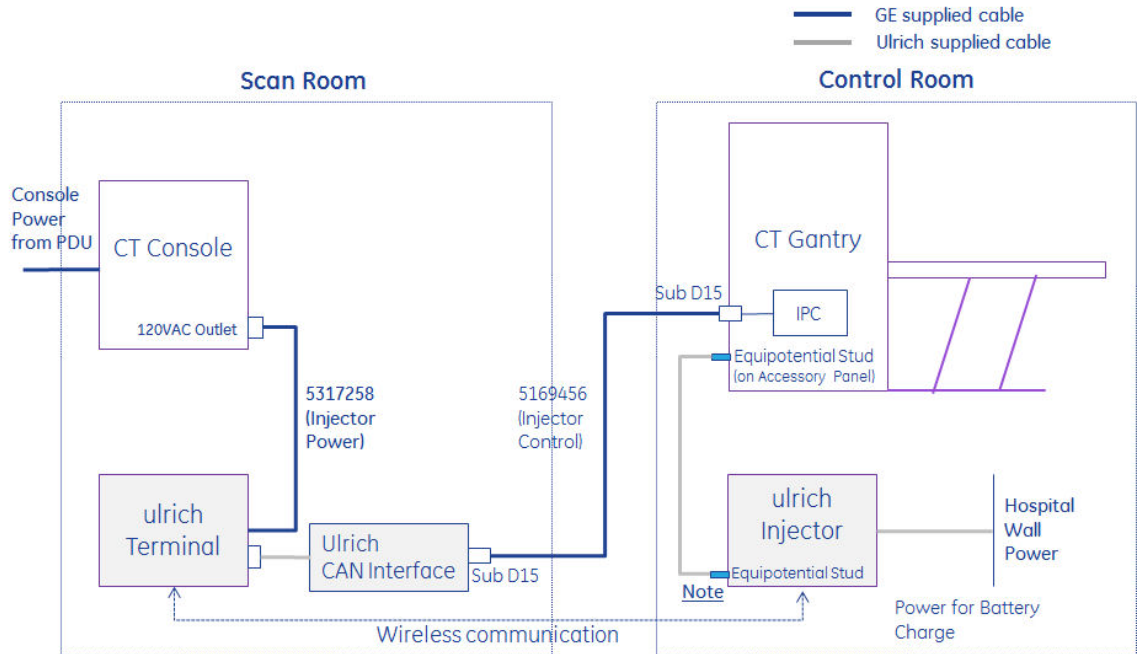


Figure 3-4 Interconnect Diagram (Medrad Stellant D with GE Supplied Power Cable)



**Figure 3-5 Interconnect Diagram (Medrad Stellant D (Certegra WS) with GESupplied Power Cable)**

### 3.3 Ulrich Injector



**Note:** ohio M does not have equipotential stud.

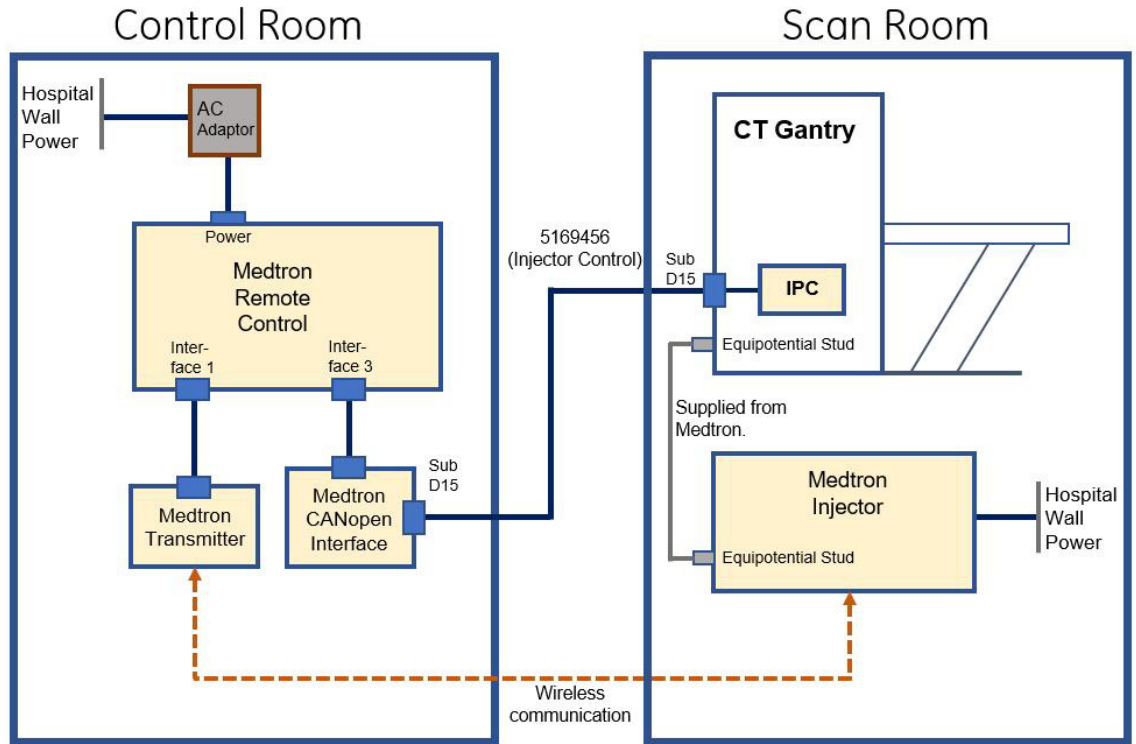
**Figure 3-6 Interconnect Diagram with Ulrich supplied Cable**



**CAUTION**

**Model “CT motion” can be applied to patient with and without battery charge.  
Model “ohio M” can only be applied to patient without battery charge.  
Equipotential wire connection must be required when Injector is used with wall power connection for battery charge.**

### 3.4 Medtron Injector



## Section 4.0 Installation Procedure

### 4.1 Install Injector

Installation of the injector is done by Injector vendor or local distributors. If GE service is responsible for the installation of the injector in your country, follow the installation manual shipped with injector.

### 4.2 Install cables between CT and Injector

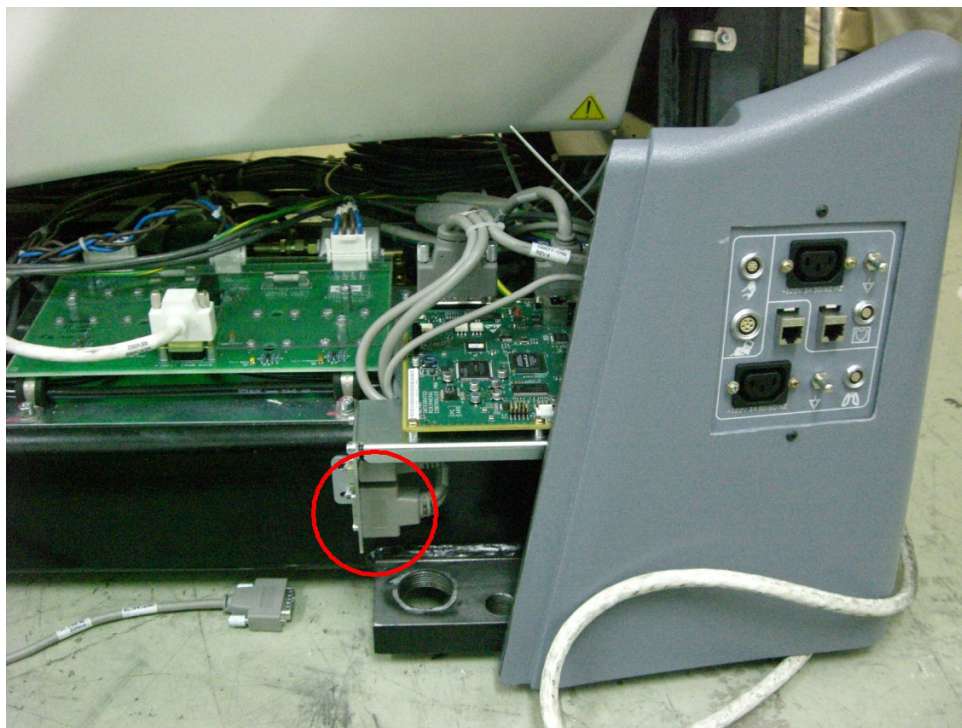


**DANGER RISK OF ELECTRIC SHOCK. USE PROPER LOCKOUT/TAGOUT PROCEDURES.**

#### 4.2.1 Preparation

##### 4.2.1.1 Cover Removal (except for Brivo CT)

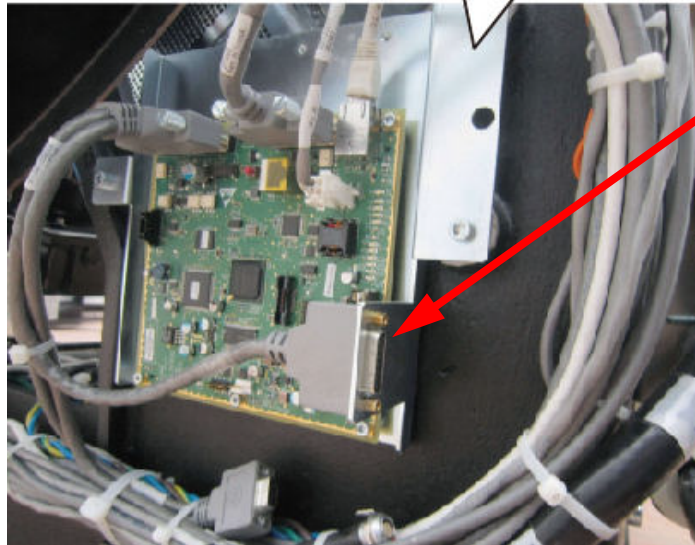
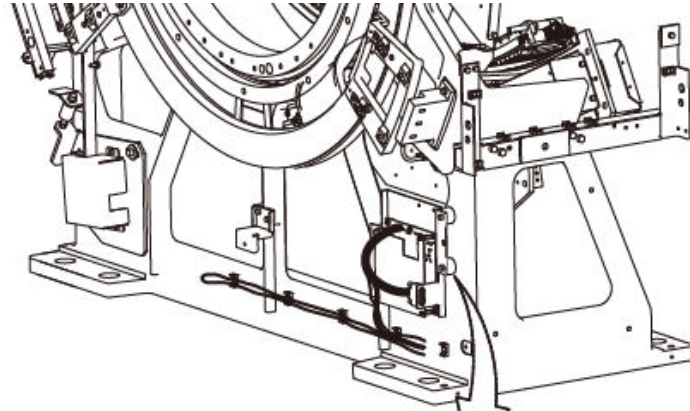
- 1.) Use an 8mm Hex wrench to unlatch the side cover from the front cover.
- 2.) Remove the right side cover by lifting it upward to release the two (2) latches, located on the top edge of the cover. Once removed, the Service Switch Panel should be exposed.
- 3.) Turn OFF all 3 switches (Axial Drive, HVDC, 120 VAC) on the Service Switch Panel.
- 4.) If installed, remove both rear base covers, to gain access to Sub D15 connector on IPC Bracket, as shown in [Figure 4-6](#).



**Figure 4-6 Sub D15 Connector (example of BrightSpeed)**

### 4.2.1.2 Cover Removal for Brivo CT

- 1.) Remove the gantry left side cover.
- 2.) Turn OFF all three switches (HVDC, Axial Drive and 120VAC) on the service switch panel.
- 3.) Remove the right, top and rear covers from the gantry.
- 4.) Gain access to Sub D15 connector on IPC bracket, as shown in [Figure 4-7](#).



Sub D15 Connector

For Brivo CT385, remove the cover on the IPC panel, then connect the Injector DB15 cable here.

Figure 4-7 Sub D15 Connector (for Brivo CT)

### 4.2.2 Install Cables

- 1.) Install Injector power cable and Sub-D Cable 5169456 according to “Interconnect Diagram” ([Figure 3-1](#) through [Figure 3-6](#)).



**WARNING**

- To insure operator and patient safety, Medrad requires the use of earth equipotential cables as shown in the diagram ([Figure 3-3](#)). (This is not necessary if GE supplied power cable (5506484) is used. See [Figure 3-4](#))



**WARNING**

- Connect power cables directly to the console (Nemoto) or the wall outlets (Medrad) as shown. Use of multi-tap powerstrips is prohibited.

### 4.3 Restore Power to the Gantry

- 1.) At the Service Switch Panel. Ensure the 3 switches, (Axial Drive, HVDC, 120VAC) are set to ON.
- 2.) Install all covers.

### 4.4 Install Option Software Key

Install option software key (Xtream Injector or Enhanced Xtream Injector) from Install Options GUI in Common Service Desktop.

For Enhanced Xtream Injector option, the Injector Setup screen appears during the installation. Choose the same pressure limit unit with Injector.



**Figure 4-8 Xtream Injector Set Up Screen**

Note: Xtream Injector and Enhanced Xtream Injector option key cannot be installed together.

## Section 5.0

# Functional Test

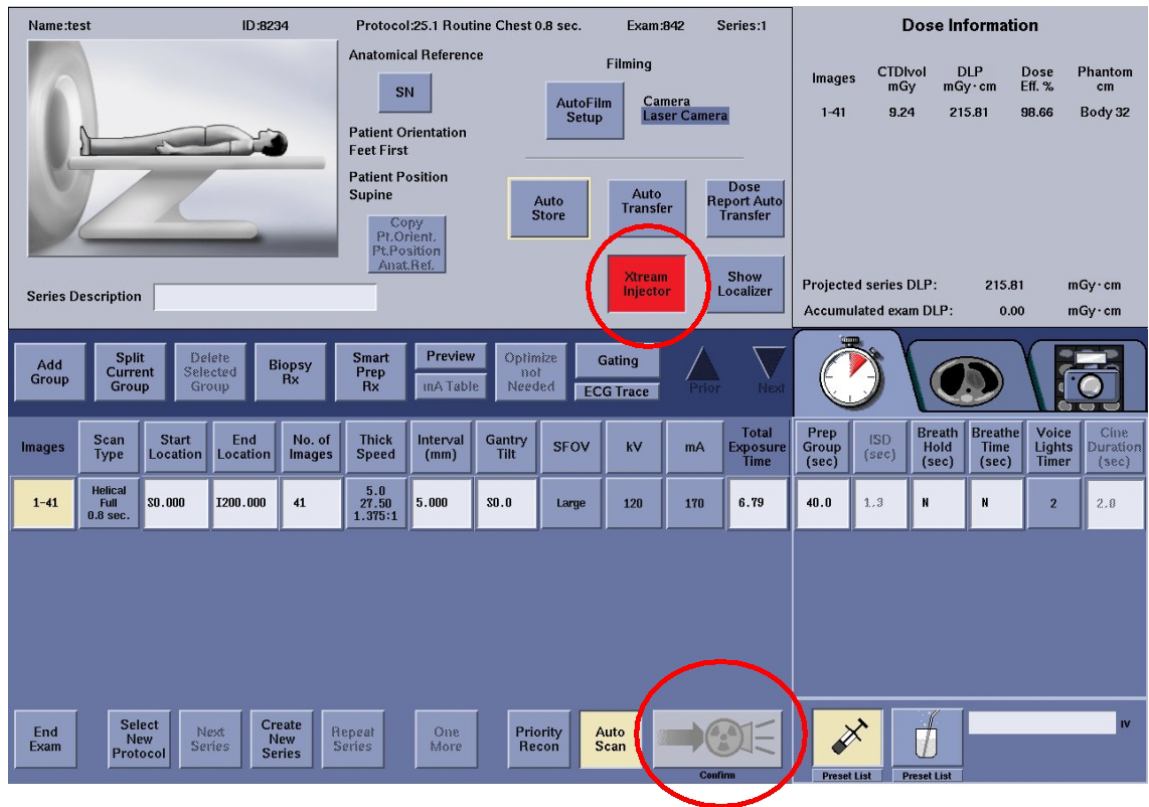
Note: The following tests need to be done with injector service personnel.

### 5.1 Verify Connection between CT and Injector

- 1.) Turn on the injector.
- 2.) Confirm the following message is logged in gesyslog,  
`IPC : Information : Validated Injector is connected.`
  - If connection to injector is OK but non-GE certified injector is connected, the following message will be logged.  
`IPC : Information : Connected injector is nothing in validated list.`
  - If none of the above message appears, it means non-compatible injector is connected or there may be hardware problems on Injector or interface (IPC or cable).

### 5.2 Functional Test for Xstream Injector Option

- 1.) Turn on the Injector and select an injection protocol on the Injector Monitor. Keep injector "NOT arming state".
- 2.) On CT Console, select a scan protocol with Xstream Injector OFF in New Patient. Set scan parameters as Axial or Helical on view edit screen.
- 3.) After [Confirm] button becomes selectable, click [Xstream Injector (blue)] button.  
[Xstream Injector (blue)] button for injector should turn to [Xstream Injector (red)].  
Then [Confirm] button is disabled.



**Figure 5-1 View Edit Screen with Xstream Injector Button**

- 4.) Press arming button\* on Injector. [Xstream Injector (red)] button on CTUI should turn to [Xstream Injector (white)]. Then [Confirm] button becomes selectable.

\*On Nemoto DualShot injector, arming button means “Air Check” button.

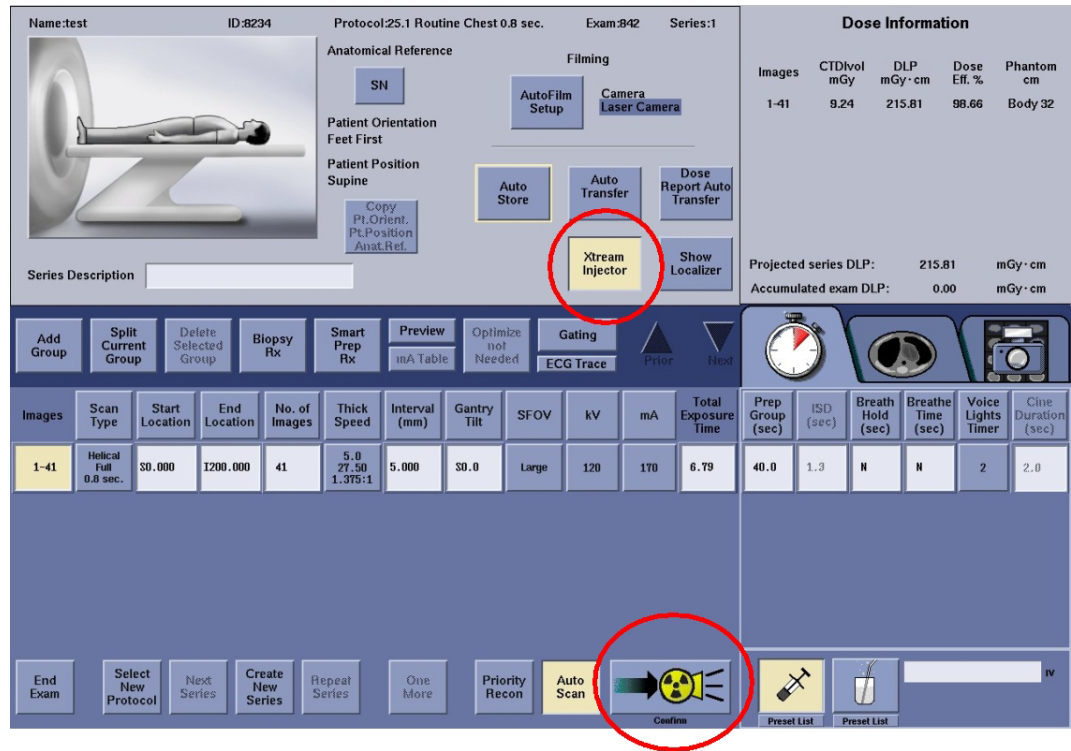


Figure 5-2 View Edit Screen with Xstream Injector Button

- 5.) Modify injector parameters on Injector Monitor.  
 [Xstream Injector (white)] button on CTUI should turn to [Xstream Injector (red)].  
 Then [Confirm] button is disabled.

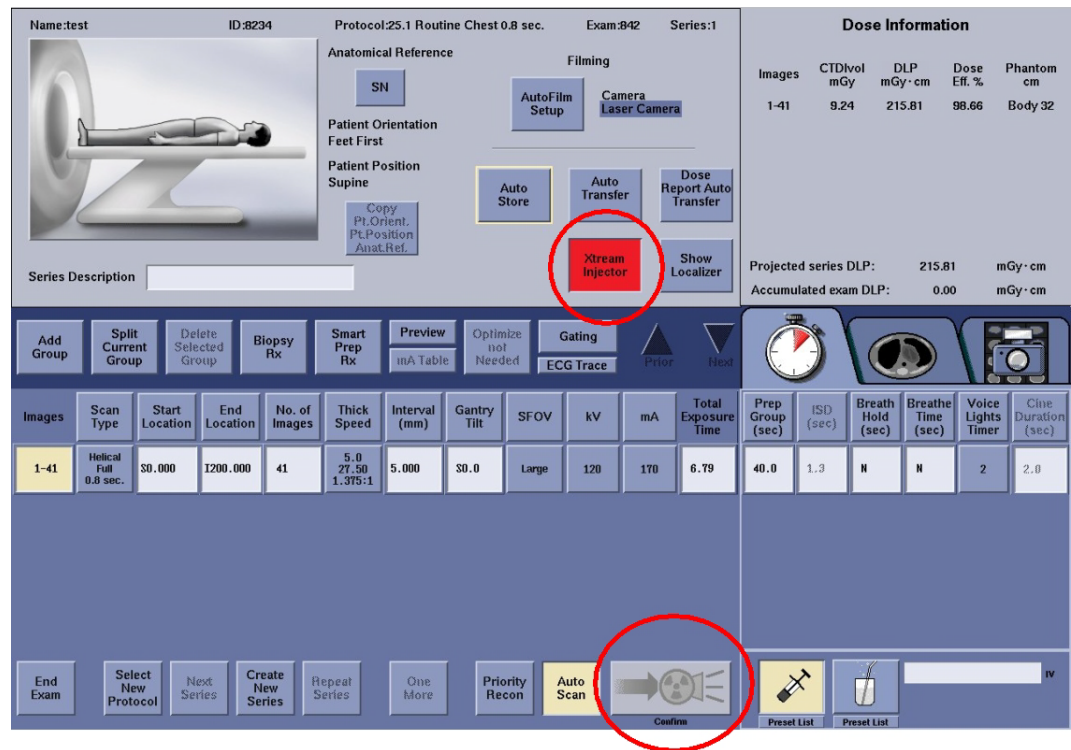
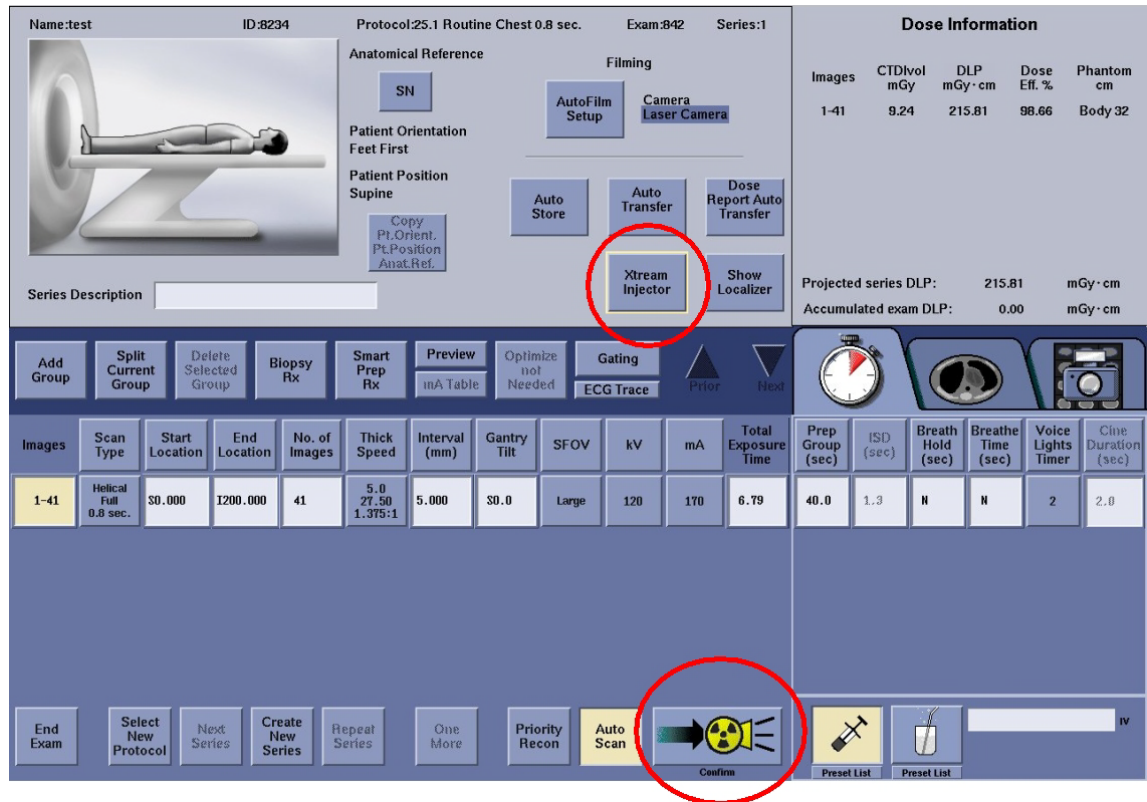


Figure 5-3 View Edit Screen with Xstream Injector Button

- 6.) Click [Xtream Injector (red)] button on CTUI.  
 [Xtream Injector (red)] button on CTUI should turn to [Xtream Injector (blue)] and [Confirm] button should become selectable.



**Figure 5-4 View Edit Screen with Xtream Injector Button**

- 7.) Click [Xtream Injector (blue)].  
 [Xtream Injector (blue)] turns to [Xtream Injector (red)].
- 8.) Press arming button on Injector.  
 [Xtream Injector (red)] turns to [Xtream Injector (white)] and [Confirm] button becomes active.
- 9.) Click [Confirm] button on view edit screen.  
 [Scan Start] on SCIM starts to blink.
- 10.) Press [Start] button on Injector.  
 Injection is not started.
- 11.) Press [Scan Start] button on SCIM. (If Scan Start gets Time Out, then click [Resume] button.)  
 Scan and Injection are started simultaneously. (Wait until scan and injection complete.)
- 12.) This completes the Xtream Injector function test.

### 5.3 Functional Test for Enhanced Xtream Injector Option

- 1.) Turn on the Injector.
- 2.) On CT Console, select a scan protocol with Xtream Injector OFF in New Patient.
- 3.) Set scan parameters as Axial or Helical on view edit screen and click [Xtream injector (blue)].

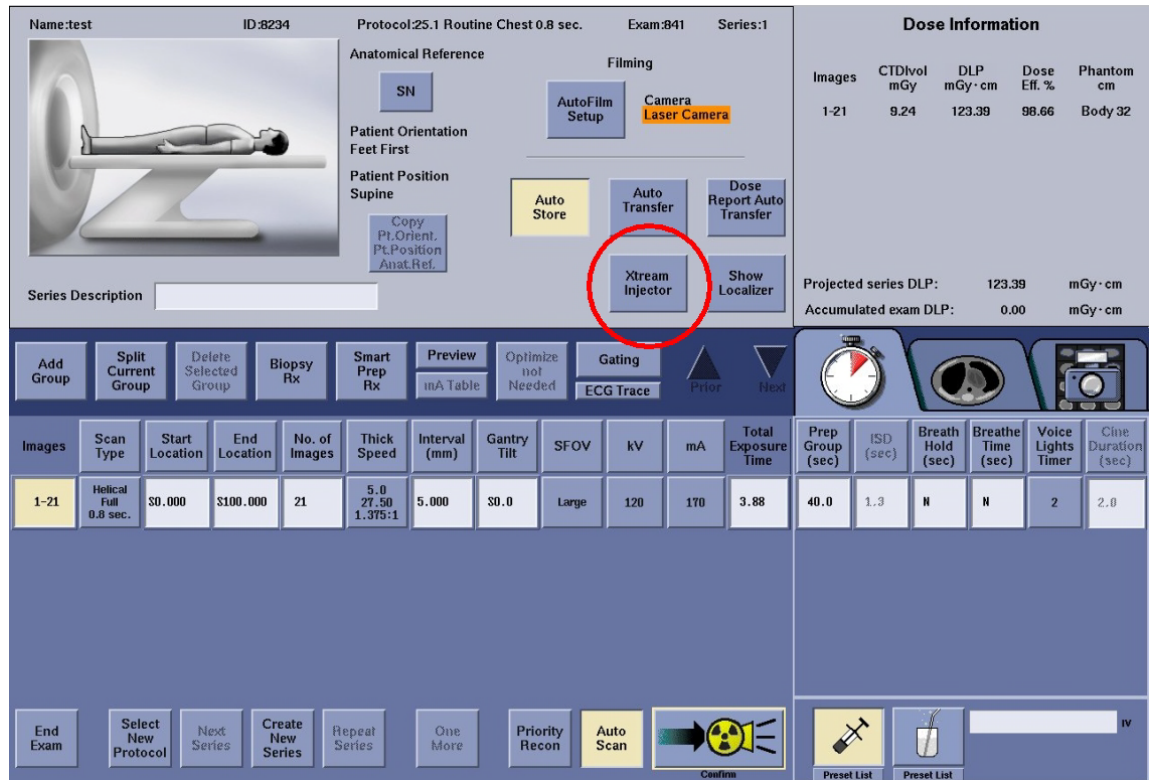


Figure 5-5 View Edit Screen with Xstream Injector Button

4.) The Enhanced Xstream Injector screen appears. Click [Off] button to turn to [On].

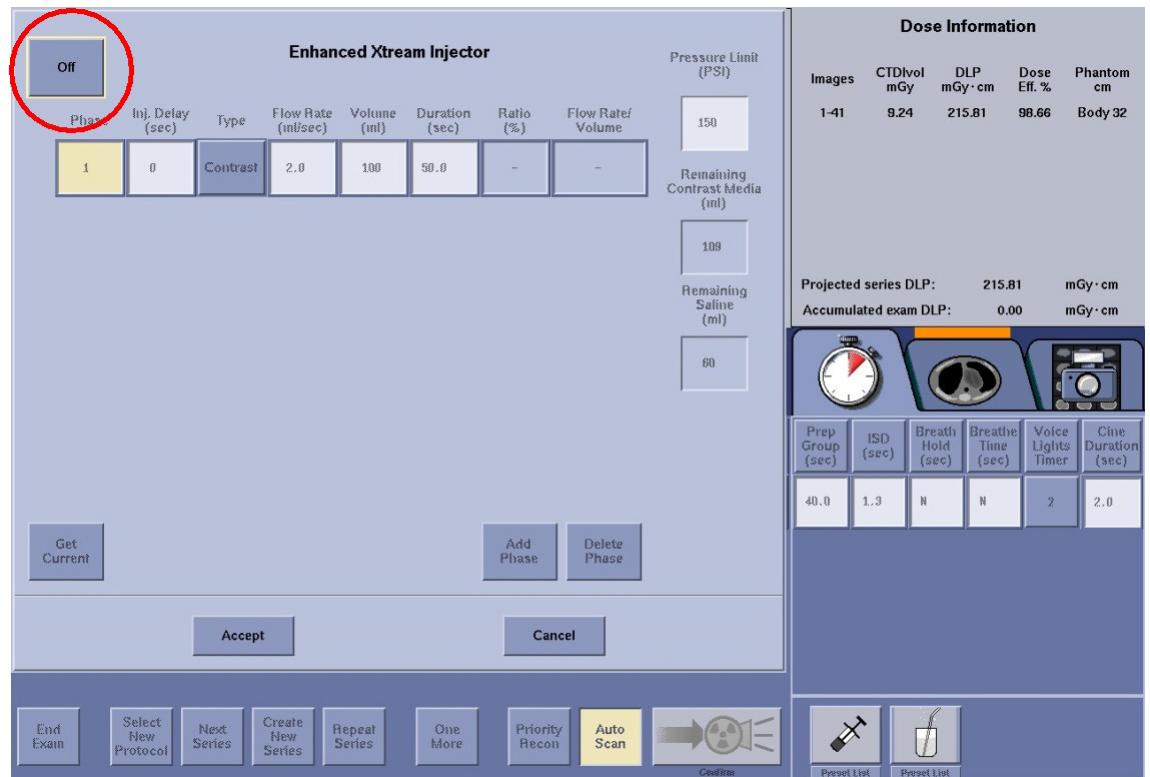
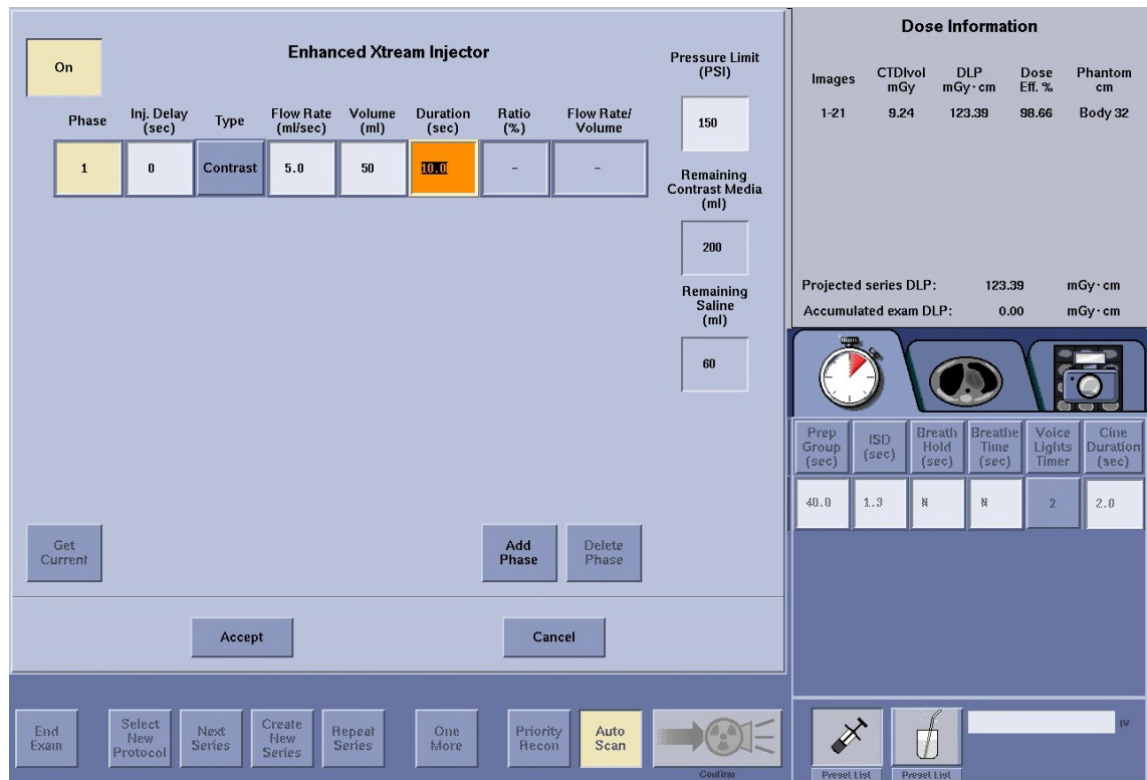


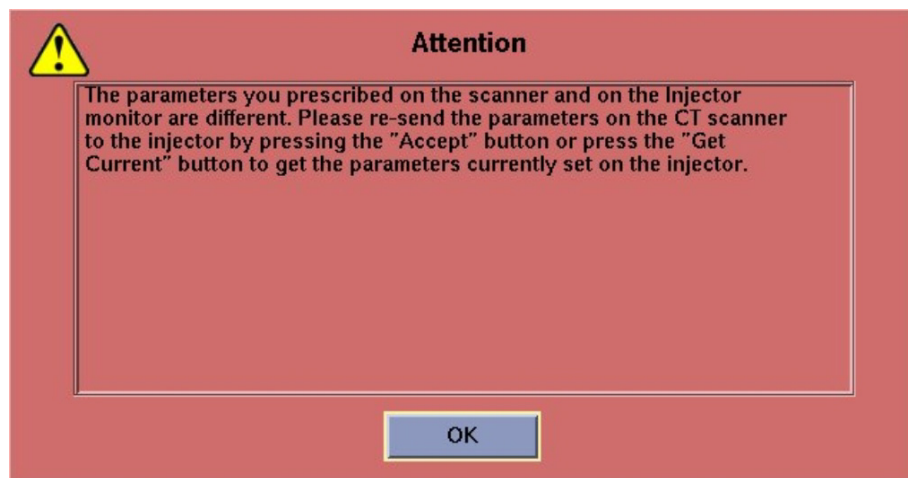
Figure 5-6 Enhanced Xstream Injector Screen

5.) Default injector parameters are shown. Modify injector parameters on the screen.



**Figure 5-7 Enhanced Xstream Injector Screen**

- 6.) Click [Accept] button. This will download the modified parameters to Injector. [Xstream injector] button becomes [Xstream Injector (Not Ready)](red).
- 7.) Modify injector parameters on Injector Monitor. Then click [Xstream Injector (red)] button on CT Console.
- 8.) Attention pop-up appears.



**Figure 5-8 Attention Pop-up**

- 9.) Click [OK] on Attention pop-up and then click [Get Current] button on the Enhanced Xstream Injector screen. This will upload the modified parameters on injector to CT.

- 10.) Modify injector parameters on the Enhanced Xtream Injector screen. Click [Accept] button.  
Parameters on CT are downloaded to injector again.  
[Xtream injector] button becomes [Xtream Injector (Not Ready)](red).
- 11.) Press arming button on Injector, and then click [Confirm] and press [Scan Start] on SCIM.
- 12.) Scan and Injection are started simultaneously. (Wait until scan and injection complete.)  
After injection completed, actual data ([Injection Actual Data]) is logged into :  
/usr/g/service/log/gesys\_<system name>.log
- 13.) This completes Enhanced Xtream Injector function test.

## Section 6.0

### System Level Safety Test

Complete the enclosure leakage (patient touch) test according to the Enclosure Leakage (Patient Touch) and System Chassis Leakage Tests procedure in system service methods CD-ROM.

## Section 7.0

### Finish Installation

#### 7.1 Process Product Locator Card

- 1.) Process the product locator card according to the instruction in your country.



# Appendix A

## Injector Status Buttons

There are several status of Xstream Injector.

Note: Definition of “Xstream Injector (red)” is different between Xstream Injector option and Enhanced Xstream Injector option.

### 1.1 Xstream Injector Status Icons


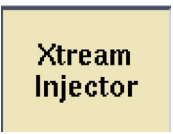

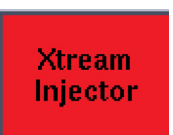

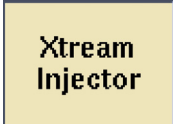
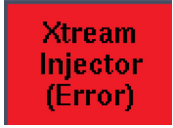


Button Status	Condition
	Xstream Injector is turned off
	Xstream Injector is turned on and injector is ready to start injection
	Xstream Injector is turned on and injector is not connected. Xstream Injector is turned on and injector is not controllable from scanner.
	Xstream Injector is turned on and injector is controllable from scanner, but not ready for injection.

Table A-2 Xstream Injector Status Icons

## 1.2 Enhanced Xtream Injector Status Icons

Button Status	Condition
	Xtream Injector is turned off
	Xtream Injector is turned on and injector is ready to start injection in New Patient
	Xtream Injector is turned on and injector is not connected. Xtream Injector is turned on and injector is not controllable from scanner.
	Xtream Injector is turned on and the parameter injector has and scanner has are different. (Both Ready / Not ready to inject) This condition also happens when setting parameter is in progress.
	Xtream Injector is turned on, parameter injector has and scanner has match, Not ready to inject.

**Table A-3 Enhanced Xtream Injector Status Icons**



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Imagination at work