GE Healthcare

Innova 2121-IQ/3131-IQ Biplane Cardiovascular Imaging System

Conformance Statement for DICOM V3.0

OPERATING DOCUMENTATION

5193428-1-800
Revision 1

ATTENTION

LES APPAREILS A RAYONS X SONT DANGEREUX A LA FOIS POUR LE PATIENT ET POUR LE MANIPULATEUR SI LES MESURES DE PROTECTION NE SONT PAS STRICTEMENT APPLIQUEES

Bien que cet appareil soit construit selon les normes de sécurité les plus sévères, la source de rayonnement X représente un danger lorsque le manipulateur est non qualifié ou non averti.
Une exposition excessive au rayonnement X entraîne des dommages à l'organisme.
Par conséquent, toutes les précautions doivent être prises pour éviter que les personnes non autorisées ou non qualifiées utilisent cet appareil créant ainsi un danger pour les autres et pour elles-mêmes.
Avant chaque manipulation, les personnes qualifiées et autorisées à se servir de cet appareil doivent se renseigner sur les mesures de protection établies par la Commission Internationale de la Protection Radiologique, Annales 26 : Recommandations de la Commission Internationale sur la Protection Radiologique et les normes nationales en vigueur.

WARNING

X-RAY EQUIPMENT IS DANGEROUS TO BOTH PATIENT AND OPERATOR UNLESS MEASURES OF PROTECTION ARE STRICTLY OBSERVED

Though this equipment is built to the highest standards of electrical and mechanical safety, the useful x-ray beam becomes a source of danger in the hands of the unauthorized or unqualified operator.
Excessive exposure to x-radiation causes damage to human tissue.
Therefore, adequate precautions must be taken to prevent unauthorized or unqualified persons from operating this equipment or exposing themselves or others to its radiation.
Before operation, persons qualified and authorized to operate this equipment should be familiar with the Recommendations of the International Commission on Radiological Protection, contained in Annals Number 26 of the ICRP, and with applicable national standards.

ATENCION

LOS APARATOS DE RAYOS X SON PELIGROSOS PARA EL PACIENTE Y EL MANIPULADOR CUANDO LAS NORMAS DE PROTECCION NO ESTAN OBSERVADAS

Aunque este aparato está construido según las normas de seguridad más estrictas, la radiación X constituye un peligro al ser manipulado por personas no autorizadas o incompetentes. Una exposición excesiva a la radiación X puede causar daños al organismo.
Por consiguiente, se deberán tomar todas las precauciones necesarias para evitar que las personas incompetentes o no autorizadas utilicen este aparato, lo que sería un peligro para los demás y para sí mismas.
Antes de efectuar las manipulaciones, las personas habilitadas y competentes en el uso de este aparato, deberán informarse sobre las normas de protección fijadas por la Comisión Internacional de la Protección Radiológica, Anales No 26: Recomendaciónes de la Comisión Internacional sobre la Protección Radiológica y normas nacionales.

ACHTUNG

RÖNTGENAPPARATE SIND EINE GEFAHR FÜR PATIENTEN SOWIE BEDIENUNGSPERSONAL, WENN DIE GELTENDEN SICHERHEITSVORKEHRUNGEN NICHT GENAU BEACHTET WERDEN

Dieser Apparat entspricht in seiner Bauweise strengsten elektrischen und mechanischen Sichereitsnormen, doch in den Händen unbefugter oder unqualifizierter Personen wird er zu einer Gefahrenquelle.
Übermäßige Röntgenbestrahlung ist für den menschlichen Organismus schädlich.
Deswegen sind hinreichende Vorsichtsmaßnahmen erforderlich, um zu verhindern, daßunbefugte oder unqualifizierte Personen solche Geräte bedienen oder sich selbst und andere Personen deren Bestrahlung aussetzen können.
Vor Inbetriebnahme dieses Apparats sollte sich das qualifizierte und befugte Bedienungspersonal mit den geltenden Kriterien für den gefahrlosen Strahleneinsatz durch sorgfältiges Studium des Hefts Nr. 26 der Internationalen Kommission für Strahlenschutz (ICRP) vertraut machen: Empfehlungen der Internationalen Kommission für Strahlenschutz und anderer nationaler Normenbehörden.

Important Information

LANGUAGE

ПРЕДУПРЕЖДЕНИЕ (BG)

- ТОВА УПЪТВАНЕ ЗА РАБОТА Е НАЛИЧНО САМО НА АНГЛИЙСКИ ЕЗИК.
- АКО ДОСТАВЧИКЪТ НА УСЛУГАТА НА КЛИЕНТА ИЗИСКА ЕЗИК, РАЗЛИЧЕН ОТ АНГЛИЙСКИ, ЗАДЪЛЖЕНИЕ НА КЛИЕНТА Е ДА ОСИГУРИ ПРЕВОД.
- НЕ ИЗПОЛЗВАЙТЕ ОБОРУДВАНЕТО ПРЕДИ ДА СТЕ СЕ КОНСУЛТИРАЛИ И РАЗБРАЛИ УПЪТВАНЕТО ЗА РАБОТА.
- 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.

警告 (ZH-CN)

- 本维修手册仅提供英文版本。
- 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。
- 未详细阅读和完全理解本维修手册之前，不得进行维修。
- 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。

VÝSTRAHA (CS)

- TENTO PROVOZNÍ NÁVOD EXISTUJE POUZE V ANGLICKÉM JAZYCE.
- V PŘÍPADĚ, ŽE EXTERNÍ SLUŽBA ZÁKAZNÍKŮM POTŘEBUJE NÁVOD V JINÉM JAZYCE, JE ZAJIŠTĚNÍ PŘEKLADU DO ODPOVÍDAJÍCÍHO JAZYKA ÚKOLEM ZÁKAZNÍKA.
- NESNAŽTE SE O ÚDRŽBU TOHOTO ZAŘÍZENÍ, ANIŽ BYSTE SI PŘEČETLI TENTO PROVOZNÍ NÁVOD A POCHOPILI JEHO OBSAH.
- V PŘÍPADĚ NEDODRŽOVÁNÍ TÉTO VÝSTRAHY MŮŽE DOJÍT K PORANĚNÍ PRACOVNÍKA PRODEJNÍHO SERVISU, OBSLUŽNÉHO PERSONÁLU NEBO PACIENTŮ VLIVEM ELEKTRICKÉHOP PROUDU, RESPEKTIVE VLIVEM MECHANICKÝCH ČI JINÝCH RIZIK.

ADVARSEL (DA)

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

WAARSCHUWING (NL)

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

WARNING (EN)

- THIS SERVICE MANUAL IS AVAILABLE IN ENGLISH ONLY.
- IF A CUSTOMER'S SERVICE PROVIDER REQUIRES A LANGUAGE OTHER THAN ENGLISH, IT IS THE CUSTOMER'S RESPONSIBILITY TO PROVIDE TRANSLATION SERVICES.
- DO NOT ATTEMPT TO SERVICE THE EQUIPMENT UNLESS THIS SERVICE MANUAL HAS BEEN CONSULTED AND IS UNDERSTOOD.
- FAILURE TO HEED THIS WARNING MAY RESULT IN INJURY TO THE SERVICE PROVIDER, OPERATOR, OR PATIENT FROM ELECTRIC SHOCK, OR FROM MECHANICAL OR OTHER HAZARDS.

HOIATUS (ET)

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

VAROITUS (FI)

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

ATTENTION (FR)

- CE MANUEL DE SERVICE N'EST DISPONIBLE QU'EN ANGLAIS.
- SI LE TECHNICIEN DU CLIENT A BESOIN DE CE MANUEL DANS UNE AUTRE LANGUE QUE L'ANGLAIS, C'EST AU CLIENT QU'IL INCOMBE DE LE FAIRE TRADUIRE.
- NE PAS TENTER D'INTERVENIR SUR LES EQUIPEMENTS TANT QUE LE MANUEL SERVICE N'A PAS ETE CONSULTE ET COMPRIS.
- LE NON-RESPECT DE CET AVERTISSEMENT PEUT ENTRAÎNER CHEZ LE TECHNICIEN, L'OPÉRATEUR OU LE PATIENT DES BLESSURES DUES À DES DANGERS ÉLECTRIQUES, MÉCANIQUES OU AUTRES.

WARNUNG (DE)

- DIESE SERVICEANLEITUNG EXISTIERT NUR IN ENGLISCHER SPRACHE.
- FALLS EIN FREMDER KUNDENDIENST EINE ANDERE SPRACHE BENÖTIGT, IST ES AUFGABE DES KUNDEN FÜR EINE ENTSPRECHENDE ÜBERSETZUNG ZU SORGEN.
- VERSUCHEN SIE NICHT DIESE ANLAGE ZU WARTEN, OHNE DIESE SERVICEANLEITUNG GELESEN UND VERSTANDEN ZU HABEN.
- WIRD DIESE WARNUNG NICHT BEACHTET, SO KANN ES ZU VERLETZUNGEN DES KUNDENDIENSTTECHNIKERS, DES BEDIENERS ODER DES PATIENTEN DURCH STROMSCHLÄGE, MECHANISCHE ODER SONSTIGE GEFAHREN KOMMEN.

ΠΡΟΕΙΔΟΠΟΙΗΣΗ (EL)

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

FIGYELMEZTETÉS (HU)

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

AÐVÖRUN
(IS)

- ÞESSI ÞJÓNUSTUHANDBÓK ER EINGÖNGU FÁANLEG Á ENSKU.
- EF AÐ ÞJÓNUSTUVEITANDI VIÐSKIPTAMANNS ÞARFNAST ANNAS TUNGUMÁLS EN ENSKU, ER ÞAÐ SKYLDA VIÐSKIPTAMANNS AÐ SKAFFA TUNGUMÁLAÞJÓNUSTU.
- REYNIÐ EKKI AÐ AFGREIÐA TÆKIÐ NEMA AÐ ÞESSI ÞJÓNUSTUHANDBÓKHEFUR VERIÐ SKOÐUÐ OG SKILIN.
- BROT Á SINNA ÞESSARI AÐVÖRUN GETUR LEITT TIL MEIÐSLA Á ÞJÓNUSTUVEITANDA, STJÓRNANDA EÐA SJÚKLINGS FRÁ RAFLOSTI, VÉLRÆNU EÐA ÖÐRUM ÁHÆTTUM.

AVVERTENZA
(IT)

- IL PRESENTE MANUALE DI MANUTENZIONE E DISPONIBILE SOLTANTO IN INGLESE.
- SE UN ADDETTO ALLA MANUTENZIONE ESTERNO ALLA GEMS RICHIEDE IL MANUALE IN UNA LINGUA DIVERSA, IL CLIENTE E TENUTO A PROVVEDERE DIRETTAMENTE ALLA TRADUZIONE.
- SI PROCEDA ALLA MANUTENZIONE DELL'APPARECCHIATURA SOLO DOPO AVER CONSULTATO IL PRESENTE MANUALE ED AVERNE COMPRESO IL CONTENUTO.
- 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.

警告
(JA)

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

경고
(KO)

- 본 서비스 지침서는 영어로만 이용하실 수 있습니다.
- 고객의 서비스 제공자가 영어 이외의 언어를 요구할 경우, 번역 서비스를 제공하는 것은 고객의 책임입니다.
- 본 서비스 지침서를 참고했고 이해하지 않는 한은 해당 장비를 수리하려고 시도하지 마십시오.
- 이 경고에 유의하지 않으면 전기 쇼크, 기계상의 혹은 다른 위험으로부터 서비스 제공자, 운영자 혹은 환자에게 위해를 가할 수 있습니다.

BRĪDINĀJUMS (LV)

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

ĮSPĖJIMAS (LT)

- ŠIS EKSPLOATAVIMO VADOVAS YRA PRIEINAMAS TIK ANGLŲ KALBA.
- JEI KLIENTO PASLAUGŲ TIEKĖJAS REIKALAUJA VADOVO KITA KALBA – NE ANGLŲ, NUMATYTI VERTIMO PASLAUGAS YRA KLIENTO ATSAKOMYBĖ.
- NEMĖGINKITE ATLIKTI ĮRANGOS TECHNINĖS PRIEŽIŪROS, NEBENT ATSIŽVELGĖTE Į ŠĮ EKSPLOATAVIMO VADOVĄ IR JĮ SUPRATOTE.
- JEI NEATKREIPSITE DĖMESIO Į ŠĮ PERSPĖJIMĄ, GALIMI SUŽALOJIMAI DĖL ELEKTROS ŠOKO, MECHANINIŲ AR KITŲ PAVOJŲ PASLAUGŲ TIEKĖJUI, OPERATORIUI AR PACIENTUI.

ADVARSEL (NO)

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

OSTRZEŻENIE (PL)

- NINIEJSZY PODRĘCZNIK SERWISOWY DOSTĘPNY JEST JEDYNIE W JĘZYKU ANGIELSKIM.
- JEŚLI DOSTAWCA USŁUG KLIENTA WYMAGA JĘZYKA INNEGO NIŻ ANGIELSKI, ZAPEWNIENIE USŁUGI TŁUMACZENIA JEST OBOWIĄZKIEM KLIENTA.
- NIE PRÓBOWAĆ SERWISOWAĆ WYPOSAŻENIA BEZ ZAPOZNANIA SIĘ I ZROZUMIENIA NINIEJSZEGO PODRĘCZNIKA SERWISOWEGO.
- NIEZASTOSOWANIE SIĘ DO TEGO OSTRZEŻENIA MOŻE SPOWODOWAĆ URAZY DOSTAWCY USŁUG, OPERATORA LUB PACJENTA W WYNIKU PORAŻENIA ELEKTRYCZNEGO, ZAGROŻENIA MECHANICZNEGO BĄDŹ INNEGO.

ATENÇÃO (PT)

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

ATENȚIE (RO)

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

ОСТОРОЖНО! (RU)

- ДАННОЕ РУКОВОДСТВО ПО ОБСЛУЖИВАНИЮ ПРЕДЛАГАЕТСЯ ТОЛЬКО НА АНГЛИЙСКОМ ЯЗЫКЕ.
- ЕСЛИ СЕРВИСНОМУ ПЕРСОНАЛУ КЛИЕНТА НЕОБХОДИМО РУКОВОДСТВО НЕ НА АНГЛИЙСКОМ, А НА КАКОМ-ТО ДРУГОМ ЯЗЫКЕ, КЛИЕНТУ СЛЕДУЕТ САМОСТОЯТЕЛЬНО ОБЕСПЕЧИТЬ ПЕРЕВОД.
- ПЕРЕД ОБСЛУЖИВАНИЕМ ОБОРУДОВАНИЯ ОБЯЗАТЕЛЬНО ОБРАТИТЕСЬ К ДАННОМУ РУКОВОДСТВУ И ПОЙМИТЕ ИЗЛОЖЕННЫЕ В НЕМ СВЕДЕНИЯ.
- НЕСОБЛЮДЕНИЕ ТРЕБОВАНИЙ ДАННОГО ПРЕДУПРЕЖДЕНИЯ МОЖЕТ ПРИВЕСТИ К ТОМУ, ЧТО СПЕЦИАЛИСТ ПО ОБСЛУЖИВАНИЮ, ОПЕРАТОР ИЛИ ПАЦИЕНТ ПОЛУЧАТ УДАР ЭЛЕКТРИЧЕСКИМ ТОКОМ, МЕХАНИЧЕСКУЮ ТРАВМУ ИЛИ ДРУГОЕ ПОВРЕЖДЕНИЕ.

UPOZORNENIE (SK)

- TENTO NÁVOD NA OBSLUHU JE K DISPOZÍCII LEN V ANGLIČTINE.
- AK ZÁKAZNÍKOV POSKYTOVATEĽ SLUŽIEB VYŽADUJE INÝ JAZYK AKO ANGLIČTINU, POSKYTNUTIE PREKLADATEĽSKÝCH SLUŽIEB JE ZODPOVEDNOSŤOU ZÁKAZNÍKA.
- NEPOKÚŠAJTE SA O OBSLUHU ZARIADENIA SKÔR, AKO SI NEPREČÍTATE NÁVOD NA OBLUHU A NEPOROZUMIETE MU.
- ZANEDBANIE TOHTO UPOZORNENIA MÔŽE VYÚSTIŤ DO ZRANENIA POSKYTOVATEĽA SLUŽIEB, OBSLUHUJÚCEJ OSOBY ALEBO PACIENTA ELEKTRICKÝM PRÚDOM, DO MECHANICKÉHO ALEBO INÉHO NEBEZPEČENSTVA.

ATENCION (ES)

- ESTE MANUAL DE SERVICIO SOLO EXISTE EN INGLES.
- SI ALGUN PROVEEDOR DE SERVICIOS AJENO A GEMS SOLICITA UN IDIOMA QUE NO SEA EL INGLES, ES RESPONSABILIDAD DEL CLIENTE OFRECER UN SERVICIO DE TRADUCCION.
- NO SE DEBERA DAR SERVICIO TECNICO AL EQUIPO, SIN HABER CONSULTADO Y COMPRENDIDO ESTE MANUAL DE SERVICIO.
- LA NO OBSERVANCIA DEL PRESENTE AVISO PUEDE DAR LUGAR A QUE EL PROVEEDOR DE SERVICIOS, EL OPERADOR O EL PACIENTE SUFRAN LESIONES PROVOCADAS POR CAUSAS ELÉCTRICAS, MECÁNICAS O DE OTRA NATURALEZA.

VARNING (SV)

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

DİKKAT (TR)

- BU SERVİS KILAVUZUNUN SADECE İNGİLİZCESİ MEVCUTTUR.
- EĞER MÜŞTERİ TEKNİSYENİ BU KILAVUZU İNGİLİZCE DIŞINDA BİR BAŞKA LİSANDAN TALEP EDERSE, BUNU TERCÜME ETTİRMEK MÜŞTERİYE DÜŞER.
- SERVİS KILAVUZUNU OKUYUP ANLAMADAN EKİPMANLARA MÜDAHALE ETMEYİNİZ.
- BU UYARIYA UYULMAMASI, ELEKTRİK, MEKANİK VEYA DİĞER TEHLİKELERDEN DOLAYI TEKNİSYEN, OPERATÖR VEYA HASTANIN YARALANMASINA YOL AÇABİLİR.

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Revision History

Part / Rev	Date	Reason for change	Pages
5193428-1-800	July 22, 2007	Initial release of direction 5193428-1-800.	102

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Table of Contents

Chapter 1 Introduction

1 Introduction

1.1 Overview

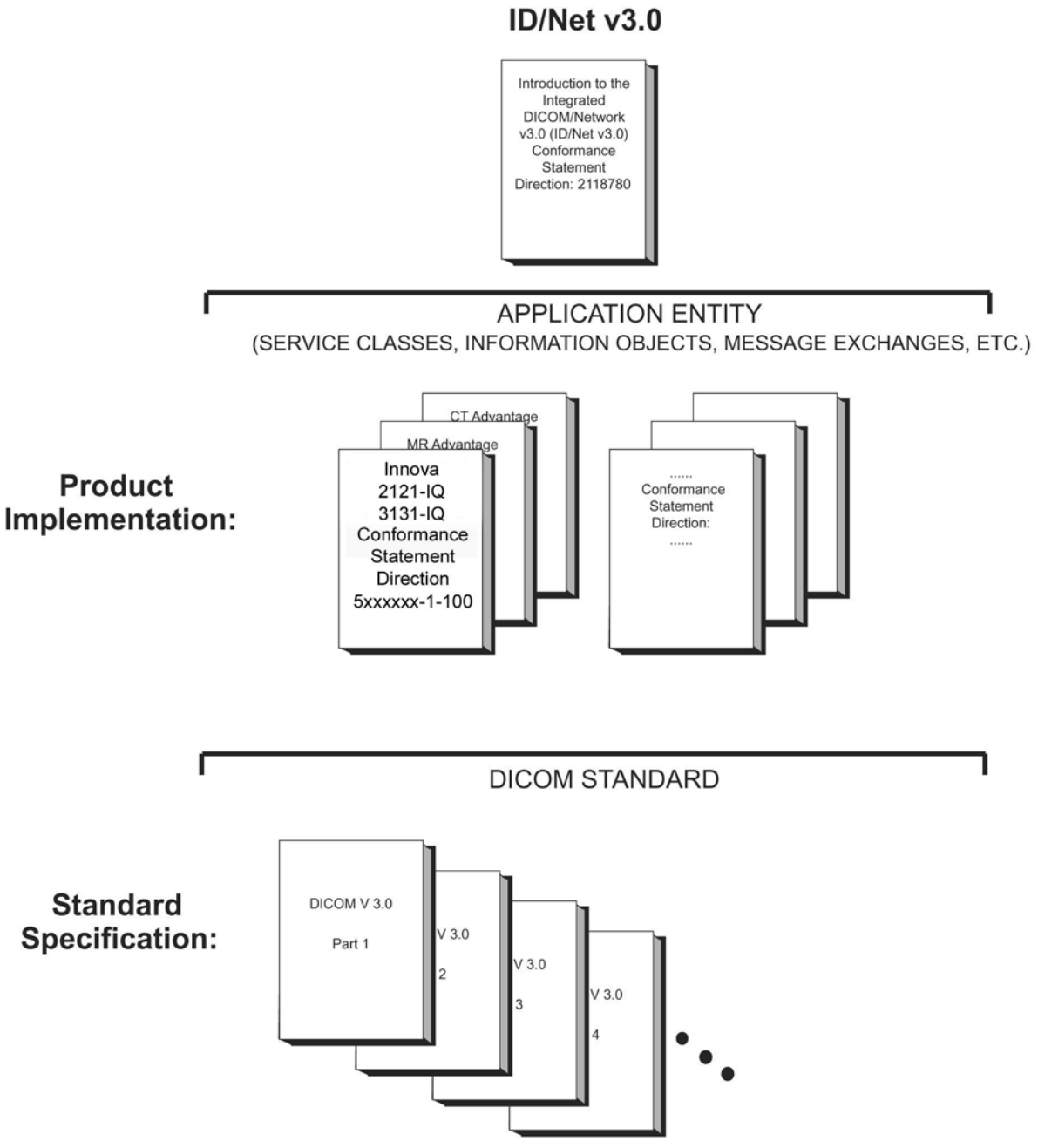
This DICOM Conformance Statement is divided into Sections as described below:

- Chapter 1 (Introduction), which describes the overall structure, intent, and references for this Conformance Statement
- Chapter 2 (Network Conformance Statement), which specifies the GEMS equipment compliance to the DICOM requirements for the implementation of Networking features.
- Chapter 3 (X–Ray Angiography Information Object Implementation), which specifies the GEMS equipment compliance to DICOM requirements for the implementation of a X–Ray Angiography Information Object.
- Chapter 4 (Secondary capture Information Object Implementation), which specifies the GEMS equipment compliance to DICOM requirements for the implementation of a Secondary capture Information Object.
- Chapter 5 (Modality Worklist Information Model), which specifies the GEMS equipment compliance to DICOM requirements for the implementation of the Modality Worklist service.
- Chapter 6 (Storage Commitment Information Model Implementation), which specifies the GEMS equipment compliance to DICOM requirements for the implementation of the Storage Commitment service.

1.2 Overall Dicom Conformance Statement Document Structure

The Documentation Structure of the GEMS Conformance Statements and their relationship with the DICOM v3.0 Conformance Statements is shown in the Illustration below.

Illustration 1-1: ID/Net v3.0



This document specifies the DICOM v3.0 implementation. It is entitled:

1. INNOVA 2121-IQ, 3131-IQ
2. Conformance Statement for DICOM v3.0
3. Direction 5193428-1–100

This DICOM Conformance Statement documents the DICOM v3.0 Conformance Statement and Technical Specification required to interoperate with the GEMS network interface.

Introductory information, which is applicable to all GEMS Conformance Statements, is described in the document:

1. Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0)
2. Conformance Statement
3. Direction: 2118780.

This Introduction familiarizes the reader with DICOM terminology and general concepts. It should be read prior to reading the individual products' GEMS Conformance Statements.

The GEMS Conformance Statement, contained in this document, also specifies the Lower Layer communications which it supports (e.g., TCP/IP). However, the Technical Specifications are defined in the DICOM v3.0 Part 8 standard.

For more information including Network Architecture and basic DICOM concepts, please refer to the Introduction.

For more information regarding DICOM, copies of the Standard may be obtained on the Internet at http://medical.nema.org. Comments on the standard may be addressed to:

DICOM Secretariat, NEMA, Suite 1847, Rosslyn, VA 22209USA Phone: +1.703.841.3200

1.3 Intended Audience

The reader of this document is concerned with software design and/or system integration issues. It is assumed that the reader of this document is familiar with the DICOM v3.0 Standards and with the terminology and concepts which are used in those Standards.

If readers are unfamiliar with DICOM v3.0 terminology they should first refer to the document listed below, then read the DICOM v3.0 Standard itself, prior to reading this DICOM Conformance Statement document.

1. Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0)
2. Conformance Statement
3. Direction: 2118780

1.4 Scope and Field Application

It is the intent of this document, in conjunction with the *Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0) Conformance Statement, Direction: 2118780*, to provide an unambiguous specification for GEMS implementations. This specification, called a Conformance Statement, includes a DICOM v3.0 Conformance Statement and is necessary to ensure proper processing and interpretation of GEMS medical data exchanged using DICOM v3.0. The GEMS Conformance Statements are available to the public.

The reader of this DICOM Conformance Statement should be aware that different GEMS devices are capable of using different Information Object Definitions. For example, a GEMS CT Scanner may send images using the CT Information Object, MR Information Object, Secondary Capture Object, etc.

Included in this DICOM Conformance Statement are the Module Definitions which define all data elements used by this GEMS implementation. If the user encounters unspecified

private data elements while parsing a GEMS Data Set, the user is well advised to ignore those data elements (per the DICOM v3.0 standard). Unspecified private data element information is subject to change without notice. If, however, the device is acting as a ”full fidelity storage device”, it should retain and re–transmit all of the private data elements which are sent by GEMS devices.

1.5 Important Remarks

The use of these DICOM Conformance Statements, in conjunction with the DICOM v3.0 Standards, is intended to facilitate communication with GE imaging equipment. However, by itself, it is not sufficient to ensure that inter–operation will be successful. The user (or user’s agent) needs to proceed with caution and address at least four issues:

- Integration – The integration of any device into an overall system of interconnected devices goes beyond the scope of standards (DICOM v3.0), and of this introduction and associated DICOM Conformance Statements when interoperability with non–GE equipment is desired. The responsibility to analyze the applications requirements and to design a solution that integrates GE imaging equipment with non–GE systems is the user’s responsibility and should not be underestimated. The user is strongly advised to ensure that such an integration analysis is correctly performed.
- Validation – Testing the complete range of possible interactions between any GE device and non–GE devices, before the connection is declared operational, should not be overlooked. Therefore, the user should ensure that any non–GE provider accepts full responsibility for all validation required for their connection with GE devices. This includes the accuracy of the image data once it has crossed the interface between the GE imaging equipment and the non–GE device and the stability of the image data for the intended applications. Such a validation is required before any clinical use (diagnosis and/or treatment) is performed. It applies when images acquired on GE imaging equipment are processed/displayed on a non–GE device, as well as when images acquired on non–GE equipment is processed/displayed on a GE console or workstation.
- Future Evolution – GE understands that the DICOM Standard will evolve to meet the user’s growing requirements. GE is actively involved in the development of the DICOM v3.0 Standard. DICOM v3.0 will incorporate new features and technologies and GE may follow the evolution of the Standard. The GEMS protocol is based on DICOM v3.0 as specified in each DICOM Conformance Statement. Evolution of the Standard may require changes to devices which have implemented DICOM v3.0. In addition, GE reserves the right to discontinue or make changes to the support of communications features (on its products) reflected on by these DICOM Conformance Statements. The user should ensure that any non–GE provider, which connects with GE devices, also plans for the future evolution of the DICOM Standard. Failure to do so will likely result in the loss of function and/or connectivity as the DICOM Standard changes and GE Products are enhanced to support these changes.
- Interaction – It is the sole responsibility of the non–GE provider to ensure that communication with the interfaced equipment does not cause degradation of GE imaging equipment performance and/or function.

1.6 References

A list of references which is applicable to all GEMS Conformance Statements is included in the *Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0) Conformance Statement, Direction: 2118780*.

The information object implementation refers to DICOM PS 3.3 (Information Object Definition).

1.7 Definitions

A set of definitions which is applicable to all GEMS Conformance Statements is included in the Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0) Conformance Statement, Direction: 2118780.

1.8 Symbols and Abbreviations

A list of symbols and abbreviations which is applicable to all GEMS Conformance Statements is included in the Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0) Conformance Statement, Direction: 2118780.

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Chapter 2 Network Conformance Statement

1 Introduction

This section of the DICOM Conformance Statement specifies the compliance to DICOM conformance requirements for the relevant Networking features on GE INNOVA product. Note that the format of this section strictly follows the format defined in DICOM Standard PS 3.2 (Conformance). Please refer to that part of the standard while reading this section.

The INNOVA System provides sophisticated image processing and storage functions. INNOVA System will provide support for DICOM 3.0 to achieve interoperability across equipment produced by different vendors.

This section details the roles and the DICOM Service Classes the INNOVA System supports.

The INNOVA System DICOM implementation allows:

- The user to copy INNOVA images acquired through the system to a remote DICOM Application Entity, using the Standard Storage DICOM Service as a Service Class User
- The user to request storage commitment for INNOVA images that were previously sent trough the system to a remote DICOM application entity, using the Storage Commitment Service as a Service Class User
- The user to check the application level communication from the INNOVA DICOM Server to a remote DICOM Application Entity. To this aim the INNOVA System uses the Verification DICOM Service Class as a Service Class User
- The user to get from the Radiology Information System (RIS) the list of procedure to be performed. This is done using the Basic Worklist Management DICOM Service as a Service Class User.
- A remote Application Entity to check the application level communication with the INNOVA System. This is done by providing the Verification DICOM Service Class as a Service Class Provider.

The details of the DICOM conformance related to other Information Objects and Information Models supported by this product are included in subsequent sections of this DICOM Conformance Statement.

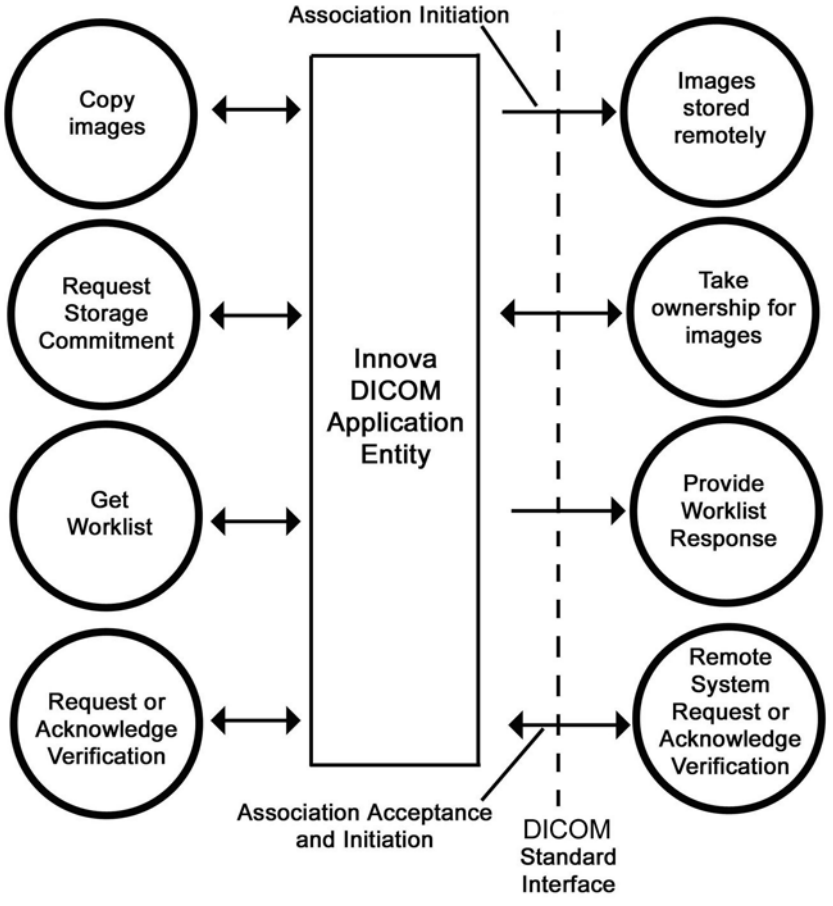
2 Implementation Module

2.1 Application Data Flow Diagram

All DICOM functionality on the INNOVA product is provided by the DL DICOM Server AE.

The Basic and Specific Application models for this device are shown in the following Illustration :

Illustration 2-1:



The INNOVA DICOM Application Entity is an application which handles DICOM protocol communication. INNOVA DICOM AE is automatically brought up when the INNOVA system is powered on.

All remote DICOM AE must be manually configured on the INNOVA, usually at the software installation time, by a GE Field Engineer.

There are four local Real World activities: Copy Images, Request Storage Commitment for a set of images, Get Worklist and Verification which can cause the INNOVA DICOM AE to initiate a DICOM association.

Copy Image consists of an operator selecting one or several images through the User Interface known as ”Browser” and ”Viewer”. Selection of Remote System and visualization of the transfer status is done in a specific screen. The remote system can be any DICOM storage SCP supporting XA modality.

Request storage commitment consists of an automatic request performed by the system after each successful image Transfer of Ownership for the Images that have been transferred earlier by the Copy Image real world activity. The remote system can be a DICOM Storage Commitment SCP.

Get Worklist activity consists of an operator request for the transfer of a list of procedure to be performed on the INNOVA acquisition system from a remote HIS/RIS system. The Remote system can be any DICOM modality worklist SCP.

Query keys can be entered for the following items:

- Patient Name
- Patient ID
- Accession number
- Procedure ID

The system can be configured to query for its own modality (XA) or AE Title.

A date or a date range for the query can also be specified.

Verification consists of an operator request for the verification of the availability of a remote station.

2.2 Functional Definition of AE’s

The INNOVA DICOM Application Entity supports the following three SCU functions

1. Copy images:
   - Access to patient demographics and pixel Data in the local database
   - Build a DICOM Dataset
   - Initiate a DICOM Association in order to request Storage Commitment for the sent image(s).
2. Request Storage Commitment:
   - Initiate a DICOM Association in order to request Storage Commitment for the sent image(s)
   - Send the N–ACTION request
   - Wait for the N–ACTION–RSP response
   - Wait for a configurable delay the N–EVENT–REPORT request
   - Send the N–EVENT–REPORT response
   - Close the association.
   - Optionally the system will accept a configurable number of DICOM associations from the Storage Commitment SCP to receive storage commitment responses.
3. Get worklist:

- Build a DICOM formatted basic worklist management data request
- Initiate a DICOM Association to send the request
- Wait for worklist response(s)
- Access to the local database to add new patient / exam demographic data
- Close the association

4. Verification:
   - Initiate a DICOM Association
   - Send the C–ECHO request
   - Wait for the C–ECHO response
   - Close the Association

The INNOVA DICOM Application Entity also serves a default SCP function, the Verification Service Class, independently from others SCU functions.

2.3 Sequencing of Real–World Activities

Not Applicable.

3 AE Specifications

Innova Dicom AE Specification:

This Application Entity provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCU :

SOP Class Name	SOP Class UID
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
X–Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31
Verification SOP Class	1.2.840.10008.1.1
Storage Commitment Push Model	1.2.840.10008.1.20.1

This Application Entity provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCP :

SOP Class Name	SOP Class UID
Verification SOP Class	1.2.840.10008.1.1

3.1 Association Establishment Policies

3.1.1 General

The DICOM Application Context Name (ACN), which is always proposed, is:

Application Context Name	1.2.840.10008.3.1.1.1

The Maximum Length PDU negotiation is included in all association establishment requests.

The maximum length PDU for an association initiated by the INNOVA DICOM Application Entity is:

Maximum Length PDU	1024 Kbytes

The SOP Class Extended Negotiation is not supported.

The maximum number of Presentation Context Items that will be proposed is 5

The user information Items sent by this product are :

- Maximum PDU Length
- Implementation UID
- Implementation Version Name

3.1.2 Number of Associations

The INNOVA DICOM AE will support a configurable number of simultaneous associations initiated by remote nodes with the Storage Commitment Push Model presentation context.

3.1.3 Asynchronous Nature

Asynchronous mode is not supported. All operations will be performed synchronously.

3.1.4 Implementation Identifying Information for Innova 2121-IQ / 3131-IQ systems

The Implementation UID for this DICOM v3.0 Implementation is:

INNOVA DL Implementation UID	1.2.840.113619.6.237

The Implementation Version Name for this DICOM v3.0 Implementation is:

INNOVA DL Implementation Version Name	INNOVA_2121_3131

3.2 Association Initiation Policy

3.2.1 Real–World Activity Copy Images

3.2.1.1 Associated Real–World Activity

The operator must select a destination in the User Interface towards which the images will be transferred.

Then one of the two following scenarios is possible:

1. The operator selects data to be sent to the destination through the User Interface. Once these selections are done, the user clicks on the “Network” button to initiate a “Copy images” operation. The INNOVA DICOM AE will then initiate a DICOM association with the selected destination and transfer the selected images on this association. For biplane sequence, INNOVA DICOM AE will initiate different DICOM associations for Frontal and Lateral acquisitions with the selected destination and transfer the selected images. Only if both frontal and lateral sequences are sent to the destination successfully, the biplane store operation is considered to be successful.
2. If system is configured for autoarchive, the INNOVA DICOM AE will automatically initiate a DICOM association with the selected destination to transfer any new image created on the system. For biplane sequences, INNOVA DICOM AE will open different DICOM associations for Frontal and Lateral acquisitions to transfer the ownership of images acquired through frontal and lateral planes.

3.2.1.2 Proposed Presentation Context Table

Presentation Context Table – Proposed					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		

Presentation Context Table – Proposed					
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
X–Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
X–Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

SOP Specific DICOM Conformance Statement for all Storage SOP Classes:

This implementation can perform multiple C–STORE operation over a single association.

Upon receiving a C–STORE confirmation containing a Successful status, this implementation will perform the next C–STORE operation. For a biplane sequence, this means two different C-STORE operations and both should be successful. The association will be maintained if possible.

Upon receiving a C–STORE confirmation containing a Refused status, this implementation will terminate the association. No new assocation will be opened to send remaining images.

Upon receiving a C–STORE confirmation containing a status other than Successful or Refused, this implementation will consider the current request to be a failure but will continue to attempt to send any remaining images in the request over a different association.

Establishing an association supports an “Association Timer”. This timer starts when the association request is sent and stops when the Association response is received. The time out value is 10 seconds.

If the above time outs expires, the association is closed and the operation in progress is considered to be failed.

Following are the status codes that are more specifically processed when receiving messages from a Storage SCP equipment:

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes	Related Fields Processed if received
Refused	A7xx	Out of resources	“Send” operation failed. Root cause indicated in error log.	(0000,0902)
	0122	SOP Class not Supported	“Send” operation failed. Root cause indicated in error log.	(0000,0902)
Error	Cxxx	Cannot Understand	“Send” operation failed	(0000,0901) (0000,0902)
	A9xx	Data Set does not match SOP Class	“Send” operation failed	(0000,0901) (0000,0902)
Warning	B000	Coercion of Data Elements	“Send” operation successful	None
	B007	Data Set does not match SOP Class	“Send” operation successful	None
	B006	Elements Discarded	“Send” operation successful	None
Success	0000	Success	“Send” operation successful	None

3.2.2 Real–World Activity Verification Acknowledge

3.2.2.1 Associated Real–World Activity

The operator must select a destination in the User Interface and press the “Verification” button. These operations will cause:

- the INNOVA DICOM Application Entity to initiate a DICOM association
- the INNOVA DICOM Application Entity to emit a C–ECHO command to check if the remote AE is available

3.2.2.2 Proposed Presentation Context Table

Presentation Context Table – Proposed					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

SOP Specific DICOM Conformance Statement for Verification SOP Class:

The INNOVA DICOM AE provides standard conformance to the DICOM Verification SOP class.

3.2.3 Real–World Activity Get Worklist

3.2.3.1 Associated Real–World Activity

The worklist transfer can be initiated either automatically when the DL application starts, or manually by either clicking the “Refresh” button in the Patient Browser interface or the “Refresh now” button in the “Define Worklist Settings” screen.

These operation will cause:

- the INNOVA Application Entity to initiate a DICOM association
- the INNOVA DL application to build the C–FIND request
- the INNOVA Application Entity to emit the C–FIND request
- the INNOVA Application Entity to receive the C–FIND Reponse(s)
- the INNOVA Application Entity to close the association
- the possibility for the user to add a new item to the local database

While the query is in progress, it is possible to cancel it by pressing a button on the patient browser. This will cause a C–FIND cancel to be sent.

3.2.3.2 Proposed Presentation Context Table

Presentation Context Table – Proposed					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

SOP Specific DICOM Conformance Statement for the Modality Worklist Information Model – FIND SOP Class:

Following are the status codes that are more specifically processed when receiving messages from a Modality Worklist SCP equipment :

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes	Related Fields Processed if received
Refused	A700	Out of resources	A message is displayed; with text “Last query failed” (more detailed information is logged in the error log).	(0000,0902)
	0122	SOP Class not Supported	A message is displayed; with text “Last query failed” (more detailed information is logged in the error log).	(0000,0902)
Failed	A900	Identifier does not match SOP class	Class A message is displayed; with text “Last query failed” (more detailed information is logged in the error log).	(0000,0901) (0000,0902)
	Cxxx	Unable to process	A message is displayed; with text “Last query failed” (more detailed information is logged in the error log).	(0000,0901) (0000,0902)
Cancel	FE00	Matching terminated due to cancel	A message is displayed; with text “Canceled”	None
Success	0000	Matching is complete – No final identifier is supplied	Worklist matches are displayed.	None
Pending	FF00	Matches are continuing – Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	None	None
	FF01	Matches are continuing – Warning that one or more Optional Keys were not supported for existence for this Identifier	None	None

3.2.4 Real–World Activity Request Storage Commitment

3.2.4.1 Associated Real–World Activity

The operator may configure the image storage destination host to have an associated Storage Commitment SCP AE (this can be the same AE as the Storage SCP). If there is an associated Storage Commitment SCP specified, after each successful image transfer the system will automatically.

1. Wait for a configurable delay time (this allows re–routing of images from Storage SCP to the Storage Commitment SCP, if needed),
2. Initiate a DICOM association to the Storage Commitment SCP to send the storage commitment request.

3.2.4.2 Proposed Presentation Context Table

Presentation Context Table – Proposed					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Storage Commitment Push Model	1.2.840.10008.20.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

3.2.4.3 SOP Specific DICOM Conformance Statement for the Storage Commitment Push Model SOP Class SCU

The Storage Commitment will be requested for all SOP Instances for which the image transfer was successful. There will be two Storage Commitment requests for Biplane acquisition [one for frontal and one for lateral]. Each request may include one or more SOP Instances, depending on the number of images that were transferred.

The AE uses DICOM network storage services to transfer SOP Instances which are to be committed.

It does not support the optional Storage Media File–Set ID and UID Attributes in the Storage Commitment N–ACTION for transfer of SOP Instances by media for Storage Commitment.

The AE may request Storage Commitment for Instances of any of the Composite SOP Classes it supports as an SCU (see)

The Storage Commitment Information Object is described in Chapter 6, Section 1, Storage commitment push model information object definition.

The AE will generate a new transaction UID at each new N–Action request. Any time after the N–Action request was sent, AE will accept storage commitment responses sent by the remote SCP for the SOP instances referenced in the request. For a Biplane sequence to be archived successfully, both frontal and lateral sequences should be archived successfully.

The association opened to send the storage commitment request will be kept open by the AE for a configurable delay. This enables the remote SCP to send the storage commitment response on the same association as the request was received. The association is closed when this timeout expires and there is no active transaction performed by the system linked to this association.

If an N–EVENT–REPORT request is received on this association, the AE will process it, and send an N–EVENT–REPORT response on the same association. The association will not be closed by the AE even if the N–EVENT–REPORT conveys failure. If the N–ACTION response conveys failure status, the association is closed by the AE. If a Storage Commitment N–EVENT–REPORT is received on the Association initiated by the Storage Commitment

SCP Application Entity, it will be processed as described for Association initiated by the Storage Commitment SCP (see Chapter 3.3.2.3). Following are the status codes that are more specifically processed when receiving messages from a Storage Commitment SCP AE:

N-ACTION response Status Codes				
Service Status	**Status Codes**	**Further Meaning**	**Application Behavior When Receiving Status Codes**	**Related Fields Processed if Received**
Sucess	0000H	successful request	Waiting for storage commitment response	None
Failed	0213H	Resource limitation	Automatic retry of storage commitment request for a configurable number of times with a configurable delay between retries	None
Failed	Other than above	Failure reason other than resource limitation	Display error status in network queue	None

3.3 Association Acceptance Policy

3.3.1 Introduction

The INNOVA DICOM AE places no limitation on who may connect to it.

Any remote AE can open an association to the INNOVA DICOM AE for the purpose of application level communication verification.

3.3.2 Real–World Activity Verification Acknowledge

3.3.2.1 Associated Real–World Activity

The INNOVA DICOM AE is always listening to associations. No operator action is required to respond to a Verification request from any DICOM node.

3.3.2.2 Accepted Presentation Context Table

Presentation Context Table – Proposed					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.1.2	SCP	None

SOP Specific Conformance Statement for Verification SOP Class:

INNOVA DICOM Application provides standard conformance to the DICOM Verification Service Class

3.3.2.3 Real–World Activity Request Storage Commitment

Associated Real–World Activity

The AE will accept a configurable number of DICOM associations to receive the storage commitment responses. The number of accepted associations can be configured from 1 to 5.

Accepted Presentation Context Table:

Presentation Context Table – Proposed					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	Role Selection Negotiation
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	Role Selection Negotiation
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Big Endian	1.2.840.10008.1.2.2	SCU	Role Selection Negotiation

SOP Specific DICOM Conformance Statement for the Storage Commitment Push Model SOP Class SCU:

The Innova accept the SCU role (which must be proposed via SCP/SCU Role Selection Negotiation) within a Presentation Context for the Storage Commitment Push Model SOP Class.

Upon receiving a Storage Commitment N–EVENT–REPORT (Storage Commitment Result), the Innova will mark all SOP Instances for which a success status is indicated with an Archived flag, shown on the user interface as “ARCHIVED”. When all Instances associated with a Study or a Patient are Archived, the Study or Patient will also be shown on the user interface with status “ARCHIVED”. Only Patients, Studies or Instances marked “ARCHIVED” may be deleted by user action without double confirmation.

If the Storage Commitment Result indicates any failure status, an error message will be displayed to the user, and the error, including the Failure Reason (0008,1197) attribute values, will be written to the error log. Any retry will be manually reinitiated. On retry the AE will transfer again the instances, and then initiate a new Storage Commitment Request for them (see). The AE will process each Failure Reason Code as described above.

Failure Reason	Meaning	Application Behavior When Receiving Reason Code
0110H	Processing failure	Display error in network queue
0112H	No such object instance	Display error in network queue
0213H	Resource limitation	Display error in network queue
0122H	Referenced SOP Class not supported	Display error in network queue
0119H	Class/Instance conflict	Display error in network queue
0131H	Duplicate transaction UID	Display error in network queue

The AE will return the standard status codes in N–EVENT–REPORT–RSP message as specified in DICOM v3.0.

4 Communication Profiles

4.1 Supported Communication Stacks (PS 3.8, PS 3.9)

DICOM Upper Layer (PS 3.8) is supported using TCP/IP.

4.2 OSI Stack

OSI stack not supported

4.3 TCP/IP Stack

The TCP/IP stack is inherited from a Windows NT Operating System.

4.3.1 API

Not applicable to this product.

4.3.2 Physical Media Support

DICOM is indifferent to the Physical medium over which TCP/IP executes (e.g. Ethernet V2.0,IEEE 802.3, ATM, FDDI)

NOTE: For more information about the Physical Media available on INNOVA System, please refer to the Product Data Sheet.

4.4 Point–to–Point Stack

A 50–pin ACR–NEMA connection is not applicable to this product.

5 Extensions / Specializations / Privatizations

None

6 Configuration

GEMS Field Service Engineers configure the INNOVA System. The DICOM configuration items below are configurable or re–configurable by a Field Service Engineer.

6.1 AE Title/Presentation Address Mapping

The INNOVA System DICOM SERVER AE allows for the configuration of the mapping of remote AE titles to IP addresses and ports. The IP address of a remote AE may be in a different sub net (using routing). GEMS Field Service Engineers perform this configuration.

6.2 Configurable Parameters

The following fields are configurable for this AE (local):

- Local AE Title
- Local IP Address
- Local IP Netmask

NOTE: The local listening port number is not configurable for this product, and is equal to 4002.

The following fields are configurable for the DICOM AE used as worklist SCP:

- Remote AE Title
- Remote IP Address
- Listening TCP/IP Port Number

NOTE: A GE Field Engineer must perform all the above configurations.

The following fields are configurable for every remote DICOM AE used as storage SCP:

- Remote AE Title
- Remote IP Address
- Listening TCP/IP Port Number
- Is archive or not
- If archive:
- Remote Storage Commitment SCP AE Title
- Remote Storage Commitment SCP IP Address
- Remote Storage Commitment SCP Listening TCP/IP Port Number
- Array size of the pixel data to be transferred (512x512, or any size up to 1024x1024).

The following fields are configurable:

- Number of automatic retries and the delay between retries of storage commitment requests
- Maximum number of associations accepted for storage commitment responses
- Delay between image transfer and storage commitment request
- Delay of releasing the association after sending the storage commitment request

7 Support of Extented Character Sets

The INNOVA System will support only the ISO_IR 100 (ISO 8859–1:1987 Latin alphabet N 1. supplementary set) as extended character sets. Any incoming worklist entry that is encoded using another extended character set will display as if it were IS0_IR 100, and any SOP Instances created for these entries will reference ISO_IR 100.

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Chapter 3 X-Ray Angiography (XA) Information Object Implementation

1 Introduction

This section specifies the use of the DICOM XA Image IOD to represent the information included in X–Ray Angiography images produced by this implementation. Corresponding attributes are conveyed using the module construct.

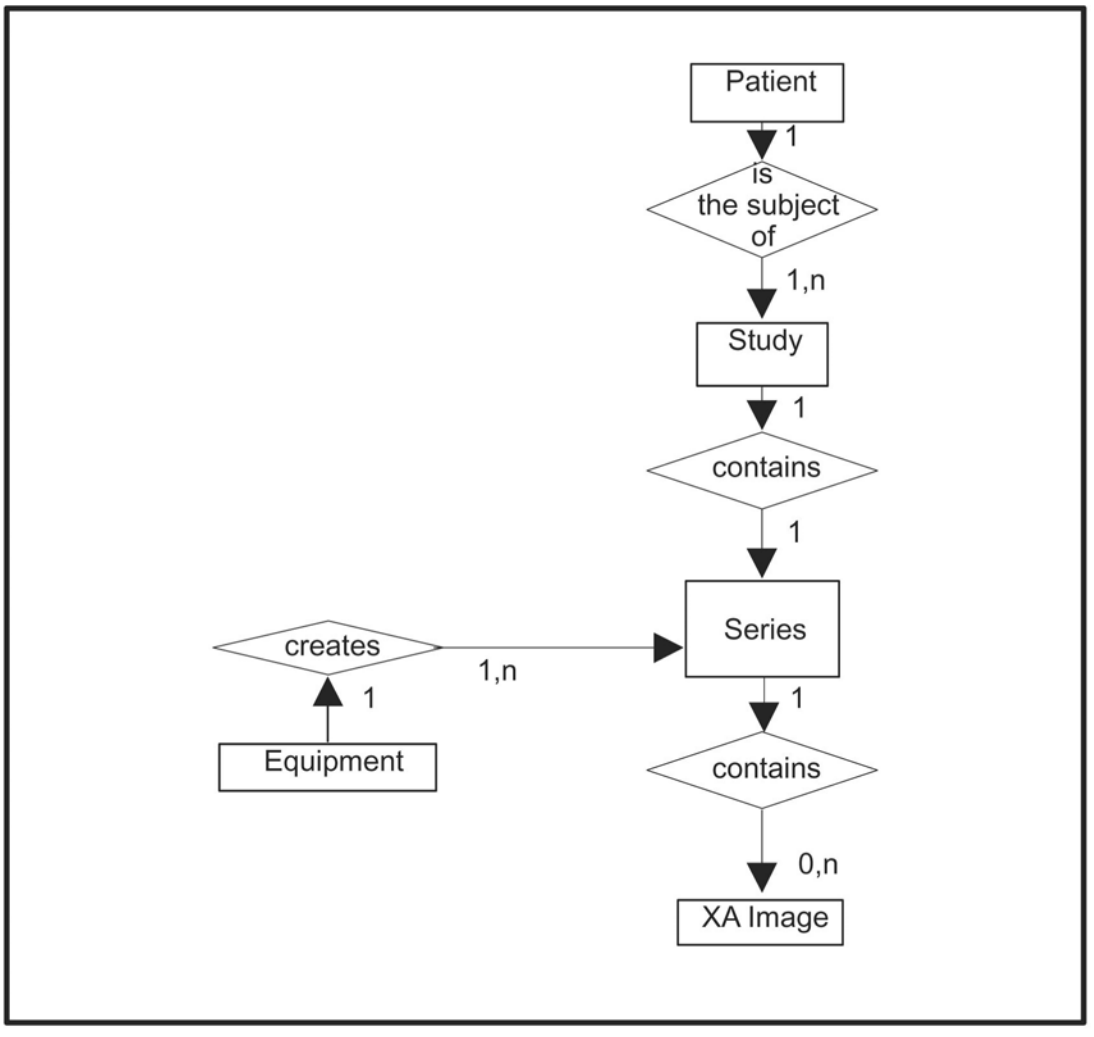
2 XA Entity Relationship Model

The Entity–Relationship diagram for the XA Image interoperability schema is shown in illustration 1 . In this figure, the following diagrammatic convention is established to represent the information organization :

- each entity is represented by a rectangular box
- each relationship is represented by a diamond shaped box.
- the fact that a relationship exists between two entities is depicted by lines connecting the corresponding entity boxes to the relationship boxes.

The relationships are fully defined with the maximum number of possible entities in the relationship shown. In other words, the relationship between Series and Image can have up to n Images per Series, between Patient and Study can have up to n Studies per Patient, but the Study to Series has 1 Series for each Study.

Illustration 3-1: XA Image Entity Relationship Diagram



2.1 Entity Descriptions

Please refer to DICOM Standard Part 3 (Information Object Definitions) for a description of each of the entities contained within the XA Information Object.

2.2 Innova Mapping of DICOM Entities

Table 3-1: Mapping of DICOM Entities to Innova Entities

DICOM	INNOVA Entity
Patient	Patient
Study	Exam
Series	Exam
Image	Sequence
Frame	Not Applicable

3 IOD Module Table and Information Module Definitions

3.1 IOD Module Table

Within an entity of the DICOM v3.0 XA IOD, attributes are grouped into related set of attributes. A set of related attributes is termed a module. A module facilitates the understanding of the semantics concerning the attributes and how the attributes are related with each other. A module grouping does not infer any encoding of information into datasets.

Table 3-2 identifies the defined modules within the entities which comprise the DICOM v3.0 XA IOD. Modules are identified by Module Name.

See DICOM v3.0 Part 3 for a complete definition of the entities, modules, and attributes.

Table 3-2: XA Image IOD Modules

Entity Name	Module Name	Reference
Patient	Patient	Section 3.2.1.2
Study	General Study	Section 3.2.2.2
	Patient Study	Section 3.2.2.3
	Dose Study	Section 3.2.2.4
Series	General Series	Section 3.2.3.2
Equipment	General Equipment	Section 3.2.4.2
Image	General Image	Section 3.2.5.2
	Image Pixel	Section 3.2.5.3
	Contrast/Bolus	Section 3.2.5.4
	Cine	Section 3.2.5.5
	Multi–frame	Section 3.2.5.6
	Frame Pointers	Section 3.2.5.7
	Mask	Section 3.2.5.8
	Display Shutter	Section 3.2.5.9
	Device	Section 3.2.5.10
	Therapy	Section 3.2.5.11
	X-Ray Image	Table 3-21
	X-Ray Acquisition	Table 3-22
	X-Ray Collimator	Table 3-23
	X-Ray Table	Table 3-24
	X-Ray 3D Acquisition	Table 3-32
	X-Ray 3D Calibration	Table 3-33
	X-Ray Filtration	Table 3-25
	XA Positioner	Table 3-26
	Overlay Plane	Section 3.2.5.12
	Multi–frame Overlay	Section 3.2.5.12
	Curve	Section 3.2.5.13

Table 3-2: XA Image IOD Modules (cont'd)

Entity Name	Module Name	Reference
	Modality LUT	Section 3.2.5.14
	VOI LUT	Table 3-19
	SOP Common	Section 3.2.5.15
	SUB LUT	Table 3-27
	Gereral Frame	Table 3-28

3.2 Information Module Definitions

Please refer to DICOM v3.0 Standard Part 3 (Information Object Definitions) for a description of each of the entities and modules contained within the XA Information Object.

The following modules are included to convey Enumerated Values, Defined Terms, and Optional Attributes supported. Type 1 & Type 2 Attributes are also included for completeness and to define what values they may take and where these values are obtained from. It should be noted that they are the same ones as defined in the DICOM v3.0 Standard Part 3 (Information Object Definitions).

3.2.1 Common Study Entity Modules

3.2.1.1 Introduction

This section describes the modules of Common Patient Entity.

3.2.1.2 Patient Module

This section specifies the Attributes of the Patient that describe and identify the Patient who is the subject of a diagnostic Study. This Module contains Attributes of the patient that are needed for diagnostic interpretation of the Image and are common for all studies performed on the patient.

Table 3-3: Patient Module Attributes

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010,0010)	2	From user interface or worklist. When from user interface, value contains only last_name(restricted to 32 chars)^first_name(restricted to 31 chars). When from worklist, equals first component group.
Patient ID	(0010,0020)	2	From worklist or user interface. Restricted to 64 chars.
Patient's Birth Date	(0010,0030)	2	From user interface or worklist. Restricted to 8 chars. YYYYMMDD.
Patient's Sex	(0010,0040)	2	From user interface or worklist. "M", "F" or "O".

3.2.2 Common Study Entity Modules

The following Study IE Modules are common to all Composite Image IODs which reference the Study IE. These Module contain Attributes of the patient and study that are needed for diagnostic interpretation of the image.

3.2.2.1 Introduction

This section describes the modules of Common Study Entity

3.2.2.2 General Study Module

This section specifies the Attributes which describe and identify the Study performed upon the Patient.

Table 3-4: General Study Module Attributes

Attribute Name	Tag	Type	Attribute Description
Study Instance UID	(0020,000D)	1	Restricted to 64 characters, internally generated as follows: ”registered prefix for GEMS” + ”.2. Registered prefix within GEMS” + ”.a.b.c” encoded mac address of the DL host +”.x.y.z” unique id protected against reinstallation and reentrance.
Study Date	(0008,0020)	2	YYYYMMDD, restricted to 8 characters.
Study Time	(0008,0030)	2	HHMMSS.XXX, restricted to 10 characters.
Referring Physician’s Name	(0008,0090)	2	From User Interface or worklist, restricted to 64 characters.
Study ID	(0020,0010)	2	From User Interface or worklist, restricted to 64 characters.
Accession Number	(0008,0050)	2	From User Interface or worklist, restricted to 64 characters.
Study Description	(0008,1030)	3	From User Interface or worklist, restricted to 64 characters. (May not be sent).
Name of Physician(s) Reading Study	(0008,1060)	3	From User Interface, restricted to 64 characters. Value contains only one component. (May not be sent).
study_number	(0015,XX8F)	3	Internally generated, starting at 1. (May not be sent).

3.2.2.3 Patient Study Module

This section defines Attributes that provide information about the Patient at the time the Study was performed.

Table 3-5: Patient Study Module Attributes

Attribute Name	Tag	Type	Attribute Description
Patient’s Age	(0010,1010)	3	Either from User Interface or Calculated from Patient’s Birth Date (0010,0030). Three digits followed by one letter: In Years (Y), Months (M), Weeks (W) or Days (D). (May not be sent).
Patient’s Size	(0010,1020)	3	From User Interface or worklist, restricted to 16 characters. (May not be sent).
Patient’s Weight	(0010,1030)	3	From User Interface or worklist, restricted to 16 characters. (May not be sent).
Admission ID	(0038, 0010)	3	Identification number of the visit as assigned by the healthcare provider.

3.2.2.4 Dose study module

This section defines Attributes that provide information about the Dose at the time the Study was performed.

Table 3-6: Dose Study Module Attributes

Attribute Name	Tag	Type	Attribute Description
Study dose	(0015, xx80)	3	Total dose delivered to the patient during the study.
Study total DAP	(0015, xx81)	3	Cumulative dose area product for the study.
Study Fluoro dap	(0015, xx82)	3	Cumulative dose area product for the fluoro acquisitions performed during the study.
Study fluoro time	(0015, xx83)	3	Total time of fluoroscopy during the study.
Study record dap	(0015, xx84)	3	Cumulative dose area product for the record acquisitions performed during the study.
Study record time	(0015, xx85)	3	Total time of record acquisitions during the study.
Study dose Frontal	(0015, xx92)	3	cumulated dose for all frontal acquisitions under a study
Study total dap Frontal	(0015, xx93)	3	Cumulative dose area product for the study for frontal plane
Study fluoro dap frontal	(0015, xx94)	3	Cumulative dose area product for the fluoro acquisitions performed during the study on frontal plane
Study fluoro time frontal	(0015, xx95)	3	total frontal flouro acquisition time under a study
Study record dap frontal	(0015, xx96)	3	Cumulative dose area product for the record acquisitions performed on frontal plane during the study
Study record time frontal	(0015, xx97)	3	total frontal record time under study
Study dose lateral	(0015, xx98)	3	cumulated dose for all lateral acquisitions under a study
Study total dap lateral	(0015, xx99)	3	Cumulative dose area product for the study for lateral plane
Study fluoro dap lateral	(0015, xx9A)	3	Cumulative dose area product for the fluoro acquisitions performed during the study on lateral plane
Study fluoro time lateral	(0015, xx9B)	3	total lateral fluoro acquisition time under a study
Study record dap lateral	(0015, xx9C)	3	Cumulative dose area product for the record acquisitions performed on lateral plane during the study
Study record time lateral	(0015, xx9D)	3	total lateral record time under a study

3.2.3 Common Series Entity Modules

The following Series IE Modules are common to all Composite Image IODs which reference the Series IE.

3.2.3.1 Introduction

This section describes the modules of Common Series Entity.

3.2.3.2 General Series Module

This section specifies the Attributes which identify and describe general information about the Series within a Study.

Table 3-7: General Series Module Attributes

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	1	XA
Series Instance UID	(0020,000E)	1	Restricted to 64 characters, internally generated as follows: ”registered prefix for GEMS” + ”.2. Registered prefix within GEMS” + ”.a.b.c” encoded mac address of the DL host +”.x.y.z” unique id protected against reinstallation and reentrance.
Series Number	(0020,0011)	2	Internally generated, starting at 1.
Series Date	(0008,0021)	3	YYYYMMDD, restricted to 8 characters.
Series Time	(0008,0031)	3	HHMMSS.XXX, restricted to 10 characters.
Performing Physicians’ Name	(0008,1050)	3	From User Interface, restricted to 64 characters. (May not be sent).
Protocol Name	(0018,1030)	3	From User Interface, user defined description of the acquisition protocol.
Operators’ Name	(0008,1070)	3	From User Interface, restricted to 64 characters. (May not be sent).
Request attribute sequence	(0040,0275)	3	Sequence that contains attributes from the Imaging Service Request. In this implementation, this sequence contains only two items.
>Request procedure id	(0040,1001)	1C	Identifier that identifies the Requested Procedure in the Imaging Service Request. Required if Sequence Item is present.
>Scheduled Procedure Step ID	(0040,0009)	1C	Field always contains the value "Unknown" in the image header.

3.2.4 Common Equipment Entity Modules

The following Equipment IE Module is common to all Composite Image IODs which reference the Equipment IE.

3.2.4.1 Introduction

This section describes the modules of Common Equipment Entity.

3.2.4.2 General Equipment Module

This section specifies the attributes which identify and describe the piece of equipment which produced a series of images.

Table 3-8: General Equipment Module Attributes

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008,0070)	2	GE MEDICAL SYSTEMS
Institution Name	(0008,0080)	3	From ”Service User Interface”, configured at the installation of the system. Restricted to 64 characters.
Institution Address	(0008,0081)	3	From ”Service User Interface”, configured at the installation of the system. Restricted to 1024 characters.
Station name	(0008,1010)	3	AE Title of the system that created the DICOM image.

Table 3-8: General Equipment Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
Manufacturer's Model Name	(0008,1090)	3	DL
Device Serial Number	(0018,1000)	3	From internal configuration of the machine.
Software Versions	(0018,1020)	3	DL application version.

3.2.5 Common Image Entity Modules

The following Image IE Modules are common to all Composite Image IODs which reference the Image IE.

3.2.5.1 Introduction

This section describes the modules of Common Image Entity.

3.2.5.2 General Image Module

This section specifies the Attributes which identify and describe an image within a particular series.

Table 3-9: General Image Module Attributes

Attribute Name	Tag	Type	Attribute Description
Image Type	(0008,0008)	3	Image identification characteristics
Acquisition Date	(0008,0022)	3	YYYYMMDD, restricted to 8 characters, date the sequence was acquired.
Image Date	(0008,0023)	2C	Same as acquisition date (0008,0022)
Acquisition Time	(0008,0032)	3	HHMMSS.XXX, restricted to 10 characters.
Image Time	(0008,0033)	2C	Same as acquisition time (0008,0032)
Image number	(0020,0013)	2	Internally generated, starting at 1.
Patient Orientation	(0020,0020)	2C	Patient direction of the rows and columns of the image. Required if image does not require Image Orientation (0020,0037) and Image Position (0020,0032). This attribute contains the values corresponding to the first frame
Instance Comments	(0020,4000)	3	From User Interface, restricted to 64 characters. (May not be sent).
Referenced Image Sequence	(0008,1140)	3	A sequence which provides reference to a set of Image SOP Class/Instance identifying other images related to this image (bi-plane)
>Referenced SOP Class UID	(0008,1150)	1C	Uniquely identifies the referenced SOP Class
>Referenced SOP Instance UID	(0008,1155)	1C	Uniquely identifies the referenced SOP Instance
>Purpose of Referenced Code Sequence	(0040,A170)	3	Describes the purpose for which thereference is made. Only a single Itemshall be permitted in this sequence. Defined Context ID 7201.
>>Code Value	(0008,0100)	1C	Required if a sequence item is present
>>Code Schema Designator	(0008,0102)	1C	Required if a sequence item is present
>>Code Meaning	(0008,0104)	1C	Required if a sequence item is present

Table 3-9: General Image Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
Patient Position per Image	(0019,xxC7)	3	Patient position descriptor relative to the equipment : • head first = HFP • head first supine = HFS • head first decubitus right = HFDR • head first decubitus left = HFDL • feet first decubitus right = FFDR • feet first decubitus left = FFDL • Feet First-Prone = FFP • Feet First-Supine = FFS
Acquisition Plane	(0019,xxDE)	1C	Plane on which the current Image is acquired
DAP of Currect Record	(0019,xxE0)	1C	XRay dose, measured in dGy*cm*cm, to which the patient was exposed for the acquisition of this image

3.2.5.3 Image Pixel Module

This section specifies the Attributes that describe the pixel data of the image.

Table 3-10: Image Pixel Module Attributes

Attribute Name	Tag	Type	Attribute Description
Samples per Pixel	(0028,0002)	1	1
Photometric Interpretation	(0028,0004)	1	MONOCHROME1 or MONOCHROME2
Rows	(0028,0010)	1	Depends on the size of the FOV (imaged region of the X–ray detector), and the re– sampling applied during the DICOM conversion. Possible values can be 512 or 1000 or 864 or 800 or 750 or 736 or 608.
Columns	(0028,0011)	1	Depends on the size of the FOV (imaged region of the X–ray detector), and the re– sampling applied during the DICOM conversion. Possible values can be 512 or 1000 or 864 or 800 or 750 or 736 or 608.
Bits Allocated	(0028,0100)	1	8 or 16
Bits Stored	(0028,0101)	1	8 or 12
High Bit	(0028,0102)	1	7 or 11
Pixel Representation	(0028,0103)	1	0x0000
Pixel Data	(7FE0,0010)	1	Data stream of the pixel samples.

3.2.5.4 Contrast/Bolus Module

This section specifies the Attributes that describe the contrast/bolus used in the acquisition of the Image.

Table 3-11: Contrast/Bolus Module Attributes

Attribute Name	Tag	Type	Attribute Description
Auto injection enabled	(0019,xxA4)	3	YES/NO
Injection phase	(0019,xxA5)	3	PRE/POST

Table 3-11: Contrast/Bolus Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
Injection delay	(0019,xxA6)	3	Number of milliseconds between the injection and the reference frame. Always positive.
Reference injection frame number	(0019,xxA7)	3	Frame number of the reference frame related to the auto–injection delay.
Contrast/Bolus Agent	(0018,0010)	2	No value, zero length.

3.2.5.5 Cine Module

The table in this section specifies the Attributes of a Multi–frame Cine Image.

Table 3-12: Cine Module Attributes

Attribute Name	Tag	Type	Attribute Description
Start Trim	(0008,2142)	3	1
Stop Trim	(0008,2143)	3	Last frame of the multi–frame image.
Recommended Display Frame Rate	(0008,2144)	3	Number of frames per second (truncated to integer).
Cine Rate	(0018,0040)	3	Number of frames per second (truncated to integer).
Frame Time	(0018,1063)	1C	Nominal time (in msec) between frames.
Frame Delay	(0018,1066)	3	0.0
Frame time vector	(0018,1065)	1C	An array which contains the real time increments (in msec) between frames for a Multi-frame image. Required if Frame Increment Pointer (0028,0009) points to Frame Time Vector.
Recommended display frame rate float	(0019,xxB8)	3	Recommended rate (float) at which the frames of a Multi-frame image should be displayed in frames/second

3.2.5.6 Multi–Frame Module

This section specifies the Attributes of a Multi–frame pixel data Image.

Table 3-13: Multi–Frame Module Attributes

Attribute Name	Tag	Type	Attribute Description
Number of Frames	(0028,0008)	1	Internally generated by acquisition system. Maximum: 460.
Frame Increment Pointer	(0028,0009)	1	Frame Increment Pointer (0028,0009) points to Frame Time (0018,1063)

3.2.5.7 Frame Pointers Module

This section specifies the attributes of a Frame Pointer Module.

Table 3-14: Frame Pointers Module Attributes

Attribute Name	Tag	Type	Attribute Description
Representative Frame Number	(0028,6010)	3	Calculated as “Start Trim + round (Stop Trim - Start Trim)/2”

3.2.5.8 Mask Module

Table 3-15: Mask Module Attributes

Attribute Name	Tag	Type	Attribute Description
Recommended viewing mode	(0028,1090)	2	SUB or NAT
Mask substraction sequence	(0028,6100)	1	Defines a sequence which describe mask subtraction operations for a Multi–frame Image.
>Mask operation	(0028,6101)	1	AVG_SUB or NONE
>Applicable frame range	(0028,6102)	3	Frames of the mask operation applied during the last review.
>Mask frame numbers	(0028,6110)	1C	Frames selected as Mask during the last review. Required if Mask Operation (0028,6101) is AVG_SUB.
>Mask subpixel shift	(0028,6114)	3	Pixel shift applied during the last review.

3.2.5.9 Display Shutter Module

Table 3-16: Display Shutter Module Attributes

Attribute Name	Tag	Type	Attribute Description
Shutter Shape	(0018,1600)	1	RECTANGULAR
Shutter Left Vertical Edge	(0018,1602)	1C	Internally generated by acquisition system.
Shutter Right Vertical Edge	(0018,1604)	1C	Internally generated by acquisition system.
Shutter Upper Horizontal Edge	(0018,1606)	1C	Internally generated by acquisition system.
Shutter Lower Horizontal Edge	(0018,1608)	1C	Internally generated by acquisition system.

3.2.5.10 Device Module

The table in this section describes the Attributes of devices (e.g., catheters, markers, baskets) which are associated with a study and/or image.

Table 3-17: Device Module Attributes

Attribute Name	Tag	Type	Attribute Description
Calibration sw version	(0019,XX8F)	3	String containing algorithm generation, algorithm version and algorithm release. A new release does not change the algorithm, only change code structure (I/O, code optimization...) (May not be sent)

3.2.5.11 Therapy Module

This module is not sent.

3.2.5.12 Common Overlay Modules

- Overlay Plane Module
  This module is not sent
- Multi–Frame Overlay Module
  This module is not sent.

3.2.5.13 Curve Module

Table 3-18: Curve Module Attributes

Attribute Name	Tag	Type	Attribute Description
LV Diastolic contour	(0019,xx0C)	3	Diastolic contour image coordinates. Three or more pairs of values with the coordinates of the contour points [row and column - starting at 1,1] with respect to the origin (upper-left corner) of the pixel data.
LV Systolic contour	(0019,xx0D)	3	Systolic contour image coordinates. Three or more pairs of values with the coordinates of the contour points [row and column - starting at 1,1] with respect to the origin (upper-left corner) of the pixel data.

3.2.5.14 Common Lookup Table Modules

VOI LUT module

This section specifies the Attributes that describe the VOI LUT.

Table 3-19: VOI LUT Module Attributes

Attribute Name	Tag	Type	Attribute Description
Window center	(0028,1050)	3	Value of the window center optimized at the image acquisition.
Window width	(0028,1051)	3	Value of the window width optimized at the image acquisition.
Default brightness contrast	(0019,xx4E)	3	The brightness/contrast applied by IPOpt to the VOI during the image acquisition
User brightness contrast	(0019,xx4F)	3	The brightness/contrast modified by the user to the VOI during the image review

Modality LUT Module

This module is not sent.

3.2.5.15 SOP Common Module

The SOP Common Module is mandatory for all DICOM IODs.

This section defines the Attributes which are required for proper functioning and identification of the associated SOP Instances. They do not specify any semantics about the Real–World Object represented by the IOD.

Table 3-20: SOP Common Module Attributes

Attribute Name	Tag	Type	Attribute Description
SOP Instance UID	(0008,0018)	1	Restricted to 64 characters, internally generated as follows: ”registered prefix for GEMS” + ”.2. Registered prefix within GEMS” + ”.a.b.c” encoded mac address of the DL host +”.x.y.z” unique id protected against reinstallation and reentrance.

Table 3-20: SOP Common Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008,0016)	1	1.2.840.10008.5.1.4.1.1.12.1
Specific Character Set	(0008,0005)	1C	ISO_IR 100

3.2.5.16 X–Ray Modules

This Section describes Modules used in one or more X–Ray IODs. These Modules contain Attributes that are specific to X–Ray images.

X–Ray Image Module

Table 3-21: X–Ray Image Module Attributes

Attribute Name	Tag	Type	Attribute Description
Pixel Intensity Relationship	(0028,1040)	1	DISP, DRM or SQRT
Calibration image	(0050,0004)	3	Indicates whether a reference object (phantom) of known size is present in the image and was used for calibration. Defined terms are: YES and NO
Scan options	(0018,0022)	3	Parameters of scanning sequence

X–Ray Acquisition Module

Table 3-22: X–Ray Acquisition Module Attributes

Attribute Name	Tag	Type	Attribute Description
KVP	(0018,0060)	2	No value, Zero length.
Radiation Setting	(0018,1155)	1	GR
Exposure Time	(0018,1150)	2C	No value, Zero length.
X–Ray Tube Current	(0018,1151)	2C	No value, Zero length.
Exposure	(0018,1152)	2C	The product of exposure time and X-Ray tube current expressed in mAs. Required if either Exposure Time (0018,1150) or X-Ray tube current (0018,1151) are not present.
Radiation Mode	(0018,115A)	3	PULSED
Intensifier Size	(0018,1162)	3	204.8 for 20" detector, 307.2 for 30” detector and 409.6 for 40” detector.
Field of View Shape	(0018,1147)	3	RECTANGLE
Field of View Dimension(s)	(0018,1149)	3	From user selection in the User Interface of the acquisition system. Possible values are "400\400" OR "320\320" OR "300\300" OR "200\200" OR OR "172\172" OR "170\170" OR "160\160" OR "150\150" OR "147\147" OR "121\121" OR "120\120".
Image Pixel Spacing	(0018,1164)	3	Is the ratio between the field of view dimension and the number of rows and columns.
Field of View Origin	(0018,7030)	3	Depends on the size of the FOV (imaged region of the X–ray detector).
fov dimension double	(0019,XX0B)	3	Value in floating point resolution, whose truncature is (0018,1149). Possible values are "400.0\400.0" OR "320.0\320.0" OR "300.0\300.0" OR "200.0\200.0" OR OR "172.8\172.8" OR "170.0\170.0" OR "160.0\160.0" OR "150.0\150.0" OR "147.2\147.2" OR "121.6\121.6" OR "120.0\120.0".

Table 3-22: X–Ray Acquisition Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
Detector rotation angle	(0019,XX92)	3	Image rotation at the detector reading, before image flip.
Lambda cm pincushion distortion	(0019,XX24)	3	”0.0”. Coefficient of the pincushion distortion model of the Image Intensifier, in cm–1. This model allows to correct the position of a point of the image as function of the distance to the center of the image.
Slope LV regression	(0019,XX25)	3	”0.85”. Slope coefficient (unitless) of the linear regression correction of the Left Ventricular volume. This linear regression corrects the Left Ventricular volume calculated by the Dodge’s method from the contour of the left ventricle traced by an expert.
Intercept LV regression	(0019,XX26)	3	”4.72”. Intercept coefficient (in cm3) of the linear regression correction of the Left Ventricular volume. This linear regression corrects the Left Ventricular volume calculated by the Dodge’s method from the contour of the left ventricle traced by an expert.
Average pulse width	(0018,1154)	3	Average width of X-Ray pulse in msec.
adx acq mode	(0019,XX14)	3	This is a “numerical code” of the acquisition mode, and is used in AW to auto-start applications. Defined codes for Innova are: 100: Fluoro Store 2: Cardiac NO Sub 32: Auto DSA 116: Bolus for Pasting (Angio Sub) 126: Chase 129: 3D Calibration 140: NoSub 3D
current spatial filter strength	(0019,XXAB)	3	The strength of the spatial filters selected by the user in DL during the image Review. Values from 1 to 9.
EPT	(0019,XXA9)	3	Exposure optimization conditions (cm).
can downscan 512	(0019,XXAA)	3	Indicates the possibility to downscan the pixel data to 512x512 for exchange purposes (YES/NO).
sensor feedback	(0019,XX9A)	3	Internally generated.
Image sweep	(0019,XX95)	3	Horizontal and vertical image sweep performed by the acquisition system before sending the DICOM image. Defined terms are YES and NO.
Grid	(0018,1166)	3	Identify the grid. Defined Terms are IN (a grid is positioned) and NONE (no grid is used).
Focal spot	(0018, 1190)	3	Nominal focal spot size in mm used to acquire this image.
IP address	(0019,XX20)	3	IP address of the machine that sends the serie.
Preselected pivot rotation speed	(0019,XXC5)	3	Speed of the pivot rotation, in degrees per second, as specified by the operator before the acquisition.
Detection gain value	(0019,XXD4)	3	Value in nGy/counts computed at start of acquisition.
mR mAs calibration value	(0019,XXD5)	3	The value of the mR/mAs calibration.
DRM LUT file name	(0019,XXDC)	3	Name of the file where the DRM lookup table can be found.
DRM Strength	(0019,XXDD)	3	DRM Strength.

Table 3-22: X–Ray Acquisition Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
Acquisition Protocol User Name	(0019,xxB3)	3	Protocol name as it was entered by the user during protocol edit
Acquisition Region	(0019,xxBA)	3	Coded String to determine whether the acquisition is Cardiac or Angio. Defined terms are CARDIAC, ANGIO and UNKNOWN
Acquisition SUB mode	(0019,xxBB)	3	Coded String to determine whether the acquisition mode was designed for a subtracted or non-subtracted review. Note that this indicates if one or more masks were acquired, which is independent from the fact that the acquisition is reviewed in Sub or No-Sub
Acquisition Mode Description	(0019,xxB1)	3	The precise description of the “numerical code” (Adx acq mode). May bel be used by the “one touch protocol” editor in AW.
Acquisition Mode Display Label	(0019,xxB2)	3	Label that shall be displayed on the AW browser, for each sequence
kVp actual vector	(0019,xxAF)	3	Exposure conditions (kVp). This is a multi-valued attribute that contains the kVp for each frame
mAs actual vector	(0019,xxB0)	3	Exposure conditions (mAs). This is a multi-valued attribute that contains the mAs for each frame
img area dose x	(0008,115E)	3	XRay dose, measured in dGy*cm*cm, to which the patient was exposed for the acquisition of this image plus any non-digitally recorded fluoro which may have been performed to prepare for the acquisition of this image
Pw actual vector	(0019,xxC2)	3	Exposure conditions (pw). This is a multi-valued attribute that contains the pw for each frame
Detector gain	(0019,xx34)	3	Gain of detector.

X–Ray Collimator Module

Table 3-23: X–Ray Collimator Module Attributes

Attribute Name	Tag	Type	Attribute Description
Collimator Shape	(0018,1700)	1	RECTANGULAR
Collimator Left Vertical Edge	(0018,1702)	1C	Internally generated by the acquisition system.
Collimator Right Vertical Edge	(0018,1704)	1C	Internally generated by the acquisition system.
Collimator Upper Horizontal Edge	(0018,1706)	1C	Internally generated by the acquisition system.
Collimator Lower Horizontal Edge	(0018,1708)	1C	Internally generated by the acquisition system.

X–Ray Table Module

Table 3-24: X–Ray Table Module Attributes

Attribute Name	Tag	Type	Attribute Description
Table Motion	(0018,1134)	2	Will be DYNAMIC if table moves in at least one direction.
Table Vertical Increment	(0018,1135)	2C	Value will be filled in if Table Motion is DYNAMIC. For STATIC, will be sent as no value, zero length.
Table Longitudinal Increment	(0018,1137)	2C	Value will be filled in if Table Motion is DYNAMIC. For STATIC, will be sent as no value, zero length.
Table Lateral Increment	(0018,1136)	2C	Value will be filled in if Table Motion is DYNAMIC. For STATIC, will be sent as no value, zero length.

Table 3-24: X–Ray Table Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
Table vertical position	(0019,XX21)	3	Absolute vertical position of the table with respect to the table referential. Down moving is positive.
Table longitudinal position	(0019,XX22)	3	Absolute longitudinal position of the table with respect to the table referential. Head moving is positive.
Table lateral position	(0019,XX23)	3	Absolute lateral position of the table with respect to the table referential. Left moving is positive.
Table head tilt angle	(0018,1138)	3	Angle of the table plane in degrees relative to horizontal plane. Positive values indicate that the head of the table is upwards.
Table rotation status vector	(0019,xxBD)	3	Status of the rotation of the table in the horizontal plane for each frame of the multi-frame image. Two values are defined: YES, NO.

X–Ray Filtration Module

Table 3-25: X–Ray Filtration Module Attributes

Attribute Name	Tag	Type	Attribute Description
Contour filter type	(0018,1160)	3	Type of filter(s) inserted into the X-Ray beam (e.g. wedges). Defined Terms: STRIP, WEDGE, BUTTERFLY, MULTIPLE, NONE

XA Positioner Module

Table 3-26: XA Positioner Module Attributes

Attribute Name	Tag	Type	Attribute Description
Distance Source to Detector	(0018,1110)	3	Internally generated by the acquisition system.
Distance Source to Patient	(0018,1111)	3	Internally generated by the acquisition system.
Estimated Radiographic Magnification Factor	(0018,1114)	3	Calculated from (0018,1110) and (0018,1111)
Positioner Motion	(0018,1500)	2C	Will be DYNAMIC if Pivot or C_ARM moves. If no motion, or if L only moves, will be sent as STATIC.
Positioner Primary Angle	(0018,1510)	2	For multi–frame images, value of the first frame.
Positioner Secondary Angle	(0018,1511)	2	For multi–frame images, value of the first frame.
Positioner Primary Angle Increment	(0018,1520)	2C	Value of the RAO/LAO increments relative to the first frame. If positioner motions is STATIC, will be sent zero length.
Positioner Secondary Angle Increment	(0018,1521)	2C	Value of the CRA/CAU increments relative to the first frame. If positioner motions is STATIC, will be sent zero length.
Angle value 1	(0019,XX01)	3	Positioner angle for L arm (in degrees). Left moving is positive.
Angle value 2	(0019,XX02)	3	Positioner angle for Pivot arm (in degrees). Left moving is positive.
Angle value 3	(0019,XX03)	3	Positioner angle for C arm (in degrees). Head moving is positive.
Angle 1 increment	(0019,XX97)	3	Incremental change in L arm with respect to the angle of the first frame. Present only if positioner motion is DYNAMIC.

Table 3-26: XA Positioner Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
Angle 2 increment	(0019,XX98)	3	Incremental change in Pivot arm with respect to the angle of the first frame. Present only if positioner motion is DYNAMIC.
Angle 3 increment	(0019,XX99)	3	Incremental change in C arm with respect to the angle of the first frame. Present only if positioner motion is DYNAMIC.
SID vector	(0019,xxBE)	3	Distance in mm from source to detector center for each frame of the multi-frame image.
LP off longitudinal position Z	(0019,xxDF)	3	Displacement of Lateral ARM from isocenter of Frontal ARM.
Pivot Lateral Angle	(0019,xxE1)	3	Mechanical Pivot Lateral Angle (so-called TETA) of the first frame.
Carm Lateral Angle	(0019,xxE2)	3	Mechanical Carm Lateral Angle of the first frame.
Pivot Lateral Angle increment	(0019,xxE3)	3	Increments of the Mechanical Pivot Lateral Angle with respect to the first frame.
Carm Lateral Angle increment	(0019,xxE4)	3	Increments of the Mechanical Carm Lateral Angle with respect to the first frame.
LP off long pos Z first frame	(0019,xxE7)	3	Signed distance in mm of the Lateral ARM isocenter from the Frontal ARM isocenter, defined in the direction of the longitudinal axis of the table when the table is not rotated. Distances from the Frontal ARM isocenter to the table head are positive. This value corresponds to the first frame.
LP off long pos Z increment	(0019,xxE8)	3	Incremental change in the distance of the Lateral ARM isocenter for each frame.
SOD vector	(0019,xxE9)	3	SOD vector

3.2.5.17 Private Module

Private SUB LUT Module

Table 3-27: Private SUB LUT Module Attributes

Attribute Name	Tag	Type	Attribute Description
Applicable review mode	(0019,XX9D)	3	Review mode in which the SUB LUT module is applicable. Defined terms re NONE, NAT, SUB and BOTH
Log LUT control points	(0019,XX9E)	3	Control points of the log LUT.
Exp LUT SUB control points	(0019,XX9F)	3	Control points of the exp LUT for SUB review.
Exp LUT NOSUB control points	(0019,XXAD)	3	Control points of the exp LUT for NOSUB review.
ABD value	(0019,XXA0)	3	Average gray level value of the histogram.
Sub window center	(0019,XXA1)	3	window center applicable when the SUB LUT module is applied.
Sub window width	(0019,XXA2)	3	window width applicable when the SUB LUT module is applied.

Table 3-27: Private SUB LUT Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
SUB operator LUTs names	(0019,xxAE)	3	Three LUT files' name (2 ExpLUTs, 1 LogLUT) in the database for the Viewer to be able to configure the IP SUB operator with the LUTs used for acquisition. Names are given in following order : SUB exp LUT\NOSUB exp LUT\ log LUT
ABD Vector	(0019,xxB9)	3	Average gray level value of the histogram. Multi-values that contains the value of each single frame.

Private General Frame Module

Table 3-28: Private General Frame Module Attributes

Attribute Name	Tag	Type	Attribute Description
frame_sequence	(0025,XX0A)	3	Sequence with as many items as number of frames in the image, containing data of related to the acquisition of each frame.
>frame_id	(0025,XX02)	3	Frame identification inside the frame sequence, starting at 1.

Private Presentation Module

Table 3-29: Private Presentation Module Attributes

Attribute Name	Tag	Type	Attribute Description
User zoom factor	(0019,xx18)	3	Zoom factor (integer) applied by the user to the default image displayed.
X zoom	(0019,xx19)	3	Row number of the origin of the zoomed area with respect to the origin of the FOV area (starting at 0).
Y zoom	(0019,xx1A)	3	Column number of the origin of the zoomed area with respect to the origin of the FOV area (starting at 0).

Private Spectral Filters Module

Table 3-30: Private Spectral Filters Module Attributes

Attribute Name	Tag	Type	Attribute Description
Spectral filter thickness	(0019,xxC4)	3C	Thickness of the spectral filter applied to optimize the IQ (in µm).

Private Spatial Filters Module

Table 3-31: Private Spatial Filters Module Attributes

Attribute Name	Tag	Type	Attribute Description
user spatial filter strength	(0019,xx17)	3	The strength of the spatial filters selected by the user during the image Review, which is equivalent to the DLX strength. Values from 1 to 7.
Default spatial filter family	(0019,xx31)	3	The family of the spatial filters applied during the image acquisition.

Table 3-31: Private Spatial Filters Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
Default spatial filter strength	(0019,xx32)	3	The strength of the spatial filters applied during the image acquisition. Values from 1 to 9.
Current spatial filter strength	(0019,xxAB)	3	The strength of the spatial filters selected by the user in DL during the image Review. Values from 1 to 9.

Private X–Ray 3D Acquisition Module

Table 3-32: Private X-Ray 3D Acquisition Module Attributes

Attribute Name	Tag	Type	Attribute Description
3D structure of interest	(0019,xxC8)	3	Defined terms: VASCULAR, OTHER
3D calibration out of date flag	(0019,xxC9)	3	Defined terms: YES, NO
3D spin expected number of frames	(0019,xxCA)	3	

Private X–Ray 3D Calibration Module

Table 3-33: Private X-Ray 3D Calibration Module Attributes

Attribute Name	Tag	Type	Attribute Description
3Dcal image rows	(0021,XX01)	3	Number of rows of the image of the calibration phantom (helix) that has been used to determine the projection matrices.
3Dcal image columns	(0021,XX02)	3	Number of columns of the image of the calibration phantom (helix) that has been used to determine the projection matrices.
3Dcal field of view	(0021,XX03)	3	Field of View in mm applied to the acquisition of the calibration phantom (helix). NOTE: the size of the image of the calibration phantom may be bigger than the Field of View region.
3Dcal acquisition date	(0021,XX04)	3	Date of the acquisition of the calibration phantom.
3Dcal acquisition time	(0021,XX05)	3	Time of the acquisition of the calibration phantom.
3Dcal calibration processing date	(0021,XX06)	3	Date of the processing of the calibration that has determined the projection matrices.
3Dcal calibration processing time	(0021,XX07)	3	Time of the processing of the calibration that has determined the projection matrices.
3Dcal L arm angle	(0021,XX08)	3	Mechanical angle of the L-arm corresponding to the first image of the acquisition of the calibration phantom.
3Dcal Pivot angle vector	(0021,XX09)	3	Vector of the mechanical angles of the Pivot corresponding to all the images of the acquisition of the calibration phantom. The number of values of this attribute must be equal to the attribute (0021,xx13) "3Dcal number of images".
3Dcal C arm angle	(0021,XX0A)	3	Mechanical angle of the C-arm corresponding to the first image of the acquisition of the calibration phantom.
3Dcal matrix sequence	(0021,XX0B)	3	Sequence containing the elements of the calibration matrices. The number of items of this sequence must be equal to the attribute (0021,xx13) "3Dcal number of images".

Table 3-33: Private X-Ray 3D Calibration Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
>3Dcal matrix elements	(0021,XX0C)	3	Elements of the projection matrices. Each element is a real number represented by a maximum of 5 digits in its integer part, then a comma, then 15 digits in its fractional part.
3Dcal algorithm version	(0021,XX0D)	3	Version of the calibration algorithm.
3Dcal 3D frame unit size	(0021,XX0E)	3	Size in mm of the unity used to describe the 3D frame dimensions.
3Dcal calibration mode	(0021,XX0F)	3	Internal code used to classify the different modes of calibration.
3Dcal image frame origin row	(0021,XX10)	3	Vertical coordinate of the origin of the image frame used for the calculation of the projection matrices, given as row of the calibration image (starts at 0).
3Dcal image frame origin column	(0021,XX11)	3	Horizontal coordinate of the origin of the image frame used for the calculation of the projection matrices, given as column of the calibration image (starts at 0).
3Dcal positioner pivot rotation speed	(0021,XX12)	3	Speed of the pivot rotation, in degrees per second, as specified by the operator before the acquisition of the calibration phantom. **NOTE:** This speed may be slightly different from the actual speed of the gantry due to mechanical constraints like accelerate.
3Dcal number of images	(0021,XX13)	3	Number of projections acquired during the acquisition of the calibration phantom.
3Dcal Instance UID	(0021,XX14)	3	SOP Instance UID of the DICOM image corresponding to the acquisition of the calibration phantom.
3Dcal image pixel spacing	(0021,XX15)	3	Distance between the center of each pixel of the image of the calibration phantom, specified by a pair -row spacing value (delimiter) column spacing value in mm.
3Dcal centering mode	(0021,XX16)	3	Type of algorithm that centers the projection matrices: defined values are: "ISOCENTER", "HELIX", "RECTIFIED", "OTHER".

4 Private Data Dictionary

Table 3-34: Private Creator Identification (GEMS_DL_STUDY_01)

Attribute Name	Tag	VR	VM
Study dose	(0015,xx80)	DS	1
Study total dap	(0015,xx81)	DS	1
Study fluoro dap	(0015,xx82)	DS	1
Study fluoro time	(0015,xx83)	IS	1
Study record dap	(0015,xx84)	DS	1
Study record time	(0015,xx85)	IS	1
Study_number	(0015,xx8F)	IS	1
Study dose Frontal	(0015,xx92)	FL	1
Study total dap Frontal	(0015,xx93)	FL	1
Study fluoro dap frontal	(0015,xx94)	FL	1
Study fluoro time frontal	(0015,xx95)	IS	1
Study record dap frontal	(0015,xx96)	FL	1
Study record time frontal	(0015,xx97)	IS	1
Study dose lateral	(0015,xx98)	FL	1
Study total dap lateral	(0015,xx99)	FL	1
Study fluoro dap lateral	(0015,xx9A)	FL	1
Study fluoro time lateral	(0015,xx9B)	IS	1
Study record dap leteral	(0015,xx9C)	FL	1
Study record time lateral	(0015,xx9D)	IS	1

Table 3-35: Private Creator Identification (GEMS_DL_IMG_01)

Attribute Name	Tag	VR	VM
Patient position per image	(0019,xxC7)	CS	1
Acquisition plane	(0019,xxDE)	CS	1
DAP of currect record	(0019,xxE0)	FL	1
Auto injection enabled	(0019,xxA4)	CS	1
Injection phase	(0019,xxA5)	CS	1
Injection delay	(0019,xxA6)	DS	1
Reference injection frame number	(0019,xxA7)	IS	1
Recommended display frame rate float	(0019,xxB8)	FL	1
Calibration sw version	(0019,xx8F)	LO	1
Fov dimension double	(0019,xx0B)	DS	1-2
Detector gain	(0019,xx34)	DS	1
Image detector rotation angle	(0019,xx92)	DS	1
Image flip	(0019,xx95)	CS	2
Sensor feedback	(0019,xx9A)	DS	1-N

Table 3-35: Private Creator Identification (GEMS_DL_IMG_01) (cont'd)

Attribute Name	Tag	VR	VM
EPT	(0019,xxA9)	DS	1-N
Can downscan 512	(0019,xxAA)	CS	1
kVp actual vector	(0019,xxAF)	DS	1-N
mAs actual vector	(0019,xxB0)	DS	1-N
Acquisition Mode Description	(0019,xxB1)	LO	1
Acquisition Mode Display Label	(0019,xxB2)	LO	1
Acquisition Protocol User Name	(0019,xxB3)	LO	1
Acquisition Region	(0019,xxBA)	CS	1
Acquisition SUB mode	(0019,xxBB)	CS	1
pw actual vector	(0019,xxC2)	DS	1-N
Preselected pivot rotation speed	(0019,xxC5)	FL	1
Detection gain value	(0019,xxD4)	FL	1
mR mAs calibration value	(0019,xxD5)	FL	1
DRM LUT file name	(0019,xxDC)	LO	1
DRM Strength	(0019,xxDD)	DS	1-N
Table rotation status vector	(0019,xxBD)	CS	1-N
Angle 1 increment	(0019,xx97)	DS	1-N
Angle 2 increment	(0019,xx98)	DS	1-N
Angle 3 increment	(0019,xx99)	DS	1-N
SID vector	(0019,xxBE)	FL	1-N
LP off longitudinal position Z	(0019,xxDF)	FL	1-N
Pivot Lateral Angle	(0019,xxE1)	FL	1
Carm Lateral Angle	(0019,xxE2)	FL	1
Pivot Lateral Angle increment	(0019,xxE3)	FL	1-N
Carm Lateral Angle increment	(0019,xxE4)	FL	1-N
LP off long pos Z first frame	(0019,xxE7)	FL	1
LP off long pos Z increment	(0019,xxE8)	FL	1-N
SOD vector	(0019,xxE9)	FL	1-N
LV Diastolic contour	(0019,xx0C)	FL	2-2N
LV Systolic contour	(0019,xx0D)	FL	2-2N
Default brightness contrast	(0019,xx4E)	DS	2
User brightness contrast	(0019,xx4F)	DS	2
Applicable review mode	(0019,xx9D)	CS	1
Log lut control points	(0019,xx9E)	DS	1-N
Exp lut SUB control points	(0019,xx9F)	DS	1-N
ABD value	(0019,xxA0)	DS	1
Sub window center	(0019,xxA1)	DS	1
Sub window width	(0019,xxA2)	DS	1
Exp lut NOSUB control points	(0019,xxAD)	DS	1-N

Table 3-35: Private Creator Identification (GEMS_DL_IMG_01) (cont'd)

Attribute Name	Tag	VR	VM
SUB operator LUTs names	(0019,xxAE)	LO	1-N
ABD Vector	(0019,xxB9)	FL	1-N
3D structure of interest	(0019,xxC8)	CS	1
3D calibration out of date flag	(0019,xxC9)	CS	1
3Dspin expected number of frames	(0019,xxCA)	IS	1
Spectral filter thickness	(0019,xxC4)	IS	1
Default spatial filter family	(0019,xx31)	IS	1
Default spatial filter strength	(0019,xx32)	IS	1
Current spatial filter strength	(0019,xxAB)	IS	1

Table 3-36: Private Creator Identification (DLX_SERIE_01)

Attribute Name	Tag	VR	VM
adx acq mode	(0019,xx14)	IS	1
ip address	(0019,xx20)	LO	1
Lambda cm pincushion distortion	(0019,xx24)	DS	1
Slope LV regression	(0019,xx25)	DS	1
Intercept LV regression	(0019,xx26)	DS	1
Table vertical position	(0019,xx21)	DS	1
Table longitudinal position	(0019,xx22)	DS	1
Table lateral position	(0019,xx23)	DS	1
Angle value 1	(0019,xx01)	DS	1
Angle value 2	(0019,xx02)	DS	1
Angle value 3	(0019,xx03)	DS	1
User zoom factor	(0019,xx18)	IS	1
X zoom	(0019,xx19)	IS	1
Y zoom	(0019,xx1A)	IS	1
User spatial filter strength	(0019,xx17)	IS	1

Table 3-37: Private Creator Identification (GEMS_DL_FRAME_01)

Attribute Name	Tag	VR	VM
frame_sequence	(0025,XX0A)	SQ	1
>frame_id	(0025,XX02)	IS	1

Table 3-38: Private Creator Identification (GEMS_XR3DCAL_01)

Attribute Name	Tag	VR	VM
3Dcal image rows	(0021,XX01)	IS	1
3Dcal image columns	(0021,XX02)	IS	1
3Dcal field of view	(0021,XX03)	FL	1

Table 3-38: Private Creator Identification (GEMS_XR3DCAL_01) (cont'd)

Attribute Name	Tag	VR	VM
3Dcal acquisition date	(0021,XX04)	DA	1
3Dcal acquisition time	(0021,XX05)	TM	1
3Dcal calibration processing date	(0021,XX06)	DA	1
3Dcal calibration processing time	(0021,XX07)	TM	1
3Dcal L arm angle	(0021,XX08)	FL	1
3Dcal Pivot angle vector	(0021,XX09)	FL	1-N
3Dcal C arm angle	(0021,XX0A)	FL	1
3Dcal matrix sequence	(0021,XX0B)	SQ	1
>3Dcal matrix elements	(0021,XX0C)	LO	1-N
3Dcal algorithm version	(0021,XX0D)	LO	1
3Dcal 3D frame unit size	(0021,XX0E)	FL	1
3Dcal calibration mode	(0021,XX0F)	LO	1
3Dcal image frame origin row	(0021,XX10)	FL	1
3Dcal image frame origin column	(0021,XX11)	FL	1
3Dcal positioner pivot rotation speed	(0021,XX12)	IS	1
3Dcal number of images	(0021,XX13)	IS	1
3Dcal Instance UID	(0021,XX14)	UI	1
3Dcal image pixel spacing	(0021,XX15)	FL	2
3Dcal centering mode	(0021,XX16)	CS	1

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Chapter 4 SC Information Object Implementation

1 Introduction

This section specifies the use of the DICOM SC Image IOD to represent the information included in SC images produced by this implementation. Corresponding attributes are conveyed using the module construct.

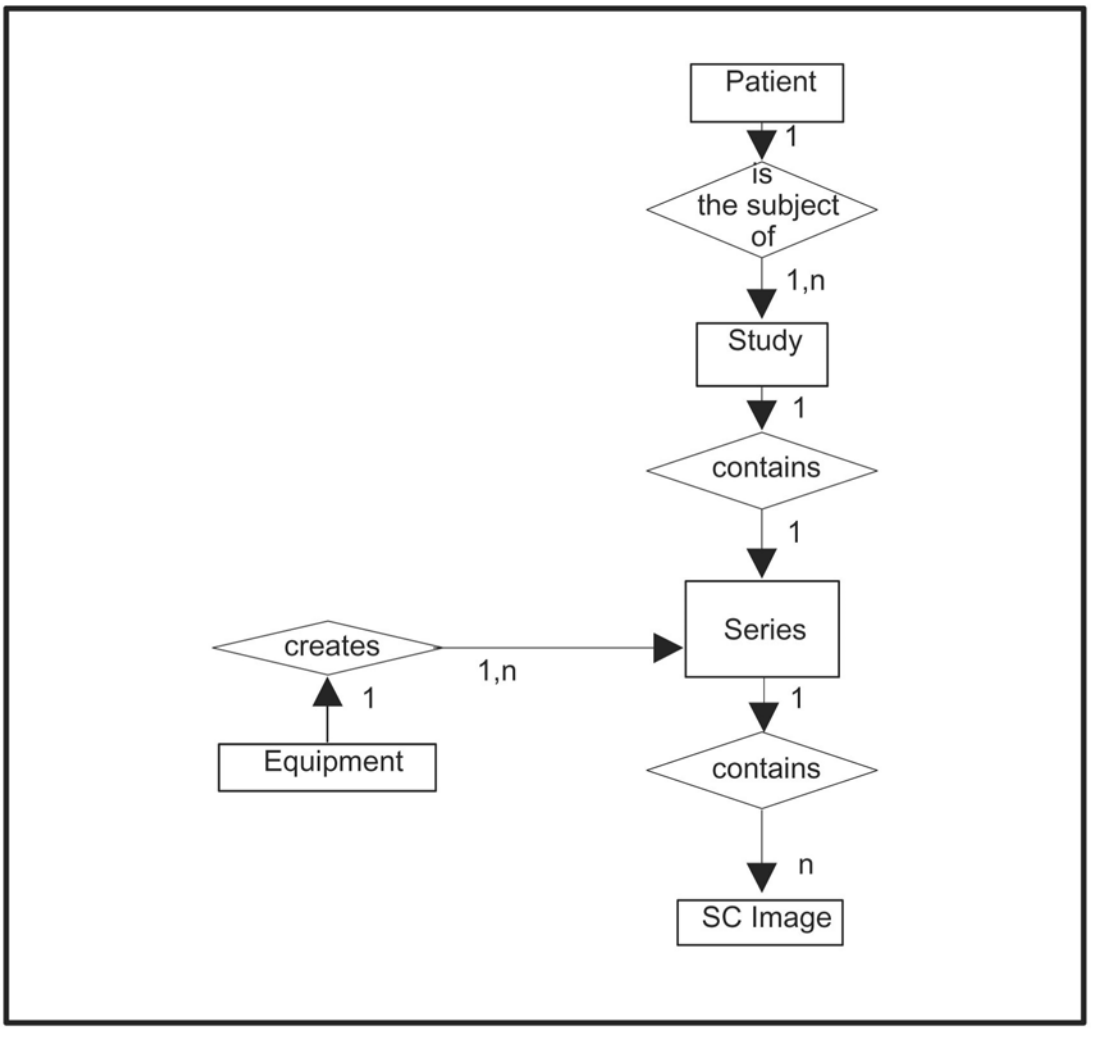
2 SC Entity Relationship Model

The Entity–Relationship diagram for the SC Image interoperability schema is shown in Illustration 4-1 . In this figure, the following diagrammatic convention is established to represent the information organization :

- Each entity is represented by a rectangular box
- Each relationship is represented by a diamond shaped box.
- The fact that a relationship exists between two entities is depicted by lines connecting the corresponding entity boxes to the relationship boxes.

The relationships are fully defined with the maximum number of possible entities in the relationship shown. In other words, the relationship between Series and Image can have up to n Images per Series, between Patient and Study can have up to n Studies per Patient, but the Study to Series has 1 Series for each Study.

Illustration 4-1: SC Image Entity Relationship Diagram



2.1 Entity Descriptions

Please refer to DICOM Standard Part 3 (Information Object Definitions) for a description of each of the entities contained within the SC Information Object.

2.2 Innova Mapping of DICOM Entities

Table 4-1: Mapping of DICOM Entities to INNOVA Entities

DICOM	<Name of the product> Entity
Patient	Patient
Study	Exam
Series	Exam
Image	Photo
Frame	Not Applicable

3 IOD Module Table and Information Module Definitions

3.1 IOD Module Table

Within an entity of the DICOM v3.0 SC IOD, attributes are grouped into related set of attributes. A set of related attributes is termed a module. A module facilitates the understanding of the semantics concerning the attributes and how the attributes are related with each other. A module grouping does not infer any encoding of information into datasets. The table in this section identifies the defined modules within the entities which comprise the DICOM v3.0 SC IOD. Modules are identified by Module Name.See DICOM v3.0 Part 3 for a complete definition of the entities, modules, and attributes.

Table 4-2: SC Image IOD Modules

Entity Name	Module Name	Reference
Patient	Patient	Section 3.2.1.2
Study	General Study	Section 3.2.2.2
	Patient Study	Section 3.2.2.3
	Dose Study	Section 3.2.2.4
Series	General Series	Section 3.2.3.2
Equipment	General Equipment	Section 3.2.4.2
	SC Equipment	Table 4-16
Image	General Image	Section 3.2.5.2
	Image Pixel	Section 3.2.5.3
	X-Ray Acquisition	Section 3.2.5.4
	XA Positioner	Section 3.2.5.5
	Curve	Section 3.2.5.6
	SC Image	Table 4-17
	Modality LUT	Section 3.2.5.7
	VOI LUT	Table 4-14
	SOP Common	Section 3.2.5.8
	Photo QCA	Section 3.2.5.10
	Photo QVA	Section 3.2.5.11

3.2 Information Module Definitions

Please refer to DICOM v3.0 Standard Part 3 (Information Object Definitions) for a description of each of the entities and modules contained within the SC Information Object. The following modules are included to convey Enumerated Values, Defined Terms, and Optional Attributes supported. Type 1 & Type 2 Attributes are also included for completeness and to define what values they may take and where these values are obtained from. It should be noted that they are the same ones as defined in the DICOM v3.0 Standard Part 3 (Information Object Definitions).

3.2.1 Common Patient Entity Modules

3.2.1.1 Introduction

This section describes the modules of Common Patient Entity

3.2.1.2 Patient Module

This section specifies the Attributes of the Patient that describe and identify the Patient who is the subject of a diagnostic Study. This Module contains Attributes of the patient that are needed for diagnostic interpretation of the Image and are common for all studies performed on the patient.

Table 4-3: Patient Module Attributes

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010,0010)	2	From user interface or worklist. When from user interface, value contains only last_name(restricted to 32 chars)^first_name(restricted to 31 chars). When from worklist, equals first component group.
Patient ID	(0010,0020)	2	From worklist or user interface. Restricted to 64 chars.
Patient's Birth Date	(0010,0030)	2	From user interface or worklist. Restricted to 64 chars. YYYYMMDD.
Patient's Sex	(0010,0040)	2	From user interface or worklist. "M", "F" or "O"

3.2.2 Common Study Entity Modules

The following Study IE Modules are common to all Composite Image IODs which reference the Study IE. These Module contain Attributes of the patient and study that are needed for diagnostic interpretation of the image.

3.2.2.1 Introduction

This section describes the modules of Common Study Entity.

3.2.2.2 General Study Module

This section specifies the Attributes which describe and identify the Study performed upon the Patient.

Table 4-4: General Study Module Attributes

Attribute Name	Tag	Type	Attribute Description
Study Instance UID	(0020,000D)	1	Restricted to 64 characters, internally generated as follows: "registred prefix for GEMS" + ".2. registred identification of Innova System within GEMS" + ".a.b.c" encoded mac address of the DL host + ".x.y.z" unique id protected against reinstallation and reentrance.
Study Date	(0008,0020)	2	YYYYMMDD, restricted to 8 characters.
Study Time	(0008,0030)	2	HHMMSS.XXX, restricted to 10 characters.
Referring Physician's Name	(0008,0090)	2	From User Interface, restricted to 64 characters.
Study ID	(0020,0010)	2	From User Interface, restricted to 64 characters.
Accession Number	(0008,0050)	2	From User Interface, restricted to 64 characters

Table 4-4: General Study Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
Study Description	(0008,1030)	3	From User Interface, restricted to 64 characters. (May not be sent).
Name of Physician(s) Reading Study	(0008,1060)	3	From User Interface, restricted to 64 characters. (May not be sent).
study_number	(0015,XX8F)	3	Internally generated, starting at 1. (May not be sent).

3.2.2.3 Patient Study Module

This section defines Attributes that provide information about the Patient at the time the Study was performed.

Table 4-5: Patient Study Module Attributes

Attribute Name	Tag	Type	Attribute Description
Patient's Age	(0010,1010)	3	Either from User Interface or Calculated from Patient's Birth Date (0010,0030). Three digits followed by one letter: In Years (Y), Months (M), Weeks (W) or Days (D). (May not be sent).
Patient's Size	(0010,1020)	3	From User Interface or worklist, restricted to 16 characters. (May not be sent).
Patient's Weight	(0010,1030)	3	From User Interface or worklist, restricted to 16 characters. (May not be sent).
Admission ID	(0038, 0010)	3	Identification number of the visit as assigned by the healthcare provider.

3.2.2.4 Dose study module

This section defines Attributes that provide information about the Dose at the time the Study was performed.

Table 4-6: Dose Study Module Attributes

Attribute Name	Tag	Type	Attribute Description
Study dose	(0015, xx80)	3	Total dose delivered to the patient during the study.
Study total DAP	(0015, xx81)	3	Cumulative dose area product for the study.
Study Fluoro dap	(0015, xx82)	3	Cumulative dose area product for the fluoro acquisitions performed during the study.
Study fluoro time	(0015, xx83)	3	Total time of fluoroscopy during the study.
Study record dap	(0015, xx84)	3	Cumulative dose area product for the record acquisitions performed during the study.
Study record time	(0015, xx85)	3	Total time of record acquisitions during the study.
Study dose Frontal	(0015, xx92)	3	cumulated dose for all frontal acquisitions under a study
Study total dap Frontal	(0015, xx93)	3	Cumulative dose area product for the study for frontal plane

Table 4-6: Dose Study Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
Study fluoro dap frontal	(0015, xx94)	3	Cumulative dose area product for the fluoro acquisitions performed during the study on frontal plane
Study fluoro time frontal	(0015, xx95)	3	total frontal flouro acquisition time under a study
Study record dap frontal	(0015, xx96)	3	Cumulative dose area product for the record acquisitions performed on frontal plane during the study
Study record time frontal	(0015, xx97)	3	total frontal record time under study
Study dose lateral	(0015, xx98)	3	cumulated dose for all lateral acquisitions under a study
Study total dap lateral	(0015, xx99)	3	Cumulative dose area product for the study for lateral plane
Study fluoro dap lateral	(0015, xx9A)	3	Cumulative dose area product for the fluoro acquisitions performed during the study on lateral plane
Study fluoro time lateral	(0015, xx9B)	3	total lateral fluoro acquisition time under a study
Study record dap lateral	(0015, xx9C)	3	Cumulative dose area product for the record acquisitions performed on lateral plane during the study
Study record time lateral	(0015, xx9D)	3	total lateral record time under a study

3.2.3 Common Series Entity Modules

The following Series IE Modules are common to all Composite Image IODs which reference the Series IE.

3.2.3.1 Introduction

This section describes the modules of Common Series Entity.

3.2.3.2 General Series Module

This section specifies the Attributes which identify and describe general information about the Series within a Study.

Table 4-7: General Series Module Attributes

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	1	XA
Series Instance UID	(0020,000E)	1	Restricted to 64 characters, internally generated as follows: “registred prefix for GEMS” + “.2. registred identification of Innova System within GEMS” + “.a.b.c” encoded mac address of the DL host + “.x.y.z” unique id protected against reinstallation and reentrance.
Series Number	(0020,0011)	2	Internally generated, starting at 1.
Series Date	(0008,0021)	3	YYYYMMDD, restricted to 8 characters.
Series Time	(0008,0031)	3	HHMMSS.XXX, restricted to 10 characters.

Table 4-7: General Series Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
Performing Physicians' Name	(0008,1050)	3	From User Interface, restricted to 64 characters. (May not be sent).
Protocol Name	(0018,1030)	3	From User Interface
Operators' Name	(0008,1070)	3	From User Interface, restricted to 64 characters. (May not be sent).
request attribute sequence	(0040,0275)	3	Sequence that contains attributes from the Imaging Service Request. In this implementation, this sequence contains only two items.
>request procedure id	(0040,1001)	1C	Identifier that identifies the Requested Procedure in the Imaging Service Request. Required if Sequence Item is present.
>Scheduled Procedure Step ID	(0040,0009)	1C	Field always contains the value "Unknown" in the image header.

3.2.4 Common Equipment Entity Modules

The following Equipment IE Module is common to all Composite Image IODs which reference the Equipment IE.

3.2.4.1 Introduction

This section describes the modules of Common Equipment Entity

3.2.4.2 General Equipment Module

This section specifies the Attributes which identify and describe the piece of equipment which produced a Series of Images.

Table 4-8: General Equipment Module Attributes

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008,0070)	2	GE MEDICAL SYSTEMS
Institution Name	(0008,0080)	3	From "Service User Interface", configured at the installation of the system. Restricted to 64 characters.
Institution Address	(0008,0081)	3	From "Service User Interface", configured at the installation of the system. Restricted to 1024 characters.
Manufacturer's Model Name	(0008,1090)	3	DL
Device Serial Number	(0018,1000)	3	From internal configuration of the machine.
Software Versions	(0018,1020)	3	DL application version.
Station name	(0018,1010)	3	AE Title of the system that generates the DICOM image.

3.2.5 Common Image Entity Modules

The following Image IE Modules are common to all Composite Image IODs which reference the Image IE.

3.2.5.1 Introduction

This section describes the modules of Common Image Entity.

3.2.5.2 General Image Module

This section specifies the Attributes which identify and describe an image within a particular series.

Table 4-9: General Image Module Attributes

Attribute Name	Tag	Type	Attribute Description
source series number	(0019,xx50)	3	number of the source series for a photo
source image number	(0019,xx51)	3	number of the source image for a photo
source frame number	(0019,xx52)	3	number of the source frame for a photo
image type	(0008,0008)	3	Image identification characteristics
acquisition date	(0008,0022)	3	YYYYMMDD, restricted to 8 characters, date the sequence was acquired.
content date	(0008,0023)	2C	the date the secondary capture is acquired.
acquisition time	(0008,0032)	3	HHMMSS.HHMMSS.XXX, restricted to 10 characters, time the sequence was acquired.
content time	(0008,0033)	2C	the time the secondary capture is acquired.
source image sequence	(0008,2112)	3	A sequence which identifies the set of Image SOP Class/Instance pairs of the images which were used to derive this image
>referenced sop class uid	(0008,2112)>(0008,1150)	1C	Uniquely identifies the referenced SOP Class
>referenced sop instance uid	(0008,2112)>(0008,1155)	1C	Uniquely identifies the referenced SOP Instance
>referenced frame number	(0008,2112)>(0008,1160)	3	references one or more frames of a multi-frame image, identifying which frames were used to derive this image
instance number	(0020,0013)	2	A number that identifies the image in the Series
patient orientation	(0020,0020)	2C	Patient direction of the rows and columns of the image. Required if image does not require Image Orientation (0020,0037) and Image Position (0020,0032). This attribute contains the values corresponding to the first frame
image comments	(0020,4000)	3	User-defined comments about the image
burned in annotation	(0028,0301)	3	Indicates whether or not the image contains sufficient burned in annotation to identify the patient and date the image was acquired. Enumerated values: YES and NO. If this attribute is absent, then the image may or may not contain burned in annotation.
Referenced Image Sequence	(0008,1140)	3	A sequence which provides reference to a set of Image SOP Class/Instance identifying other images related to this image (bi-plane)
>Referenced SOP class UID	(0008,1150)	1C	Uniquely identifies the referenced SOP Class
>Referenced SOP instance UID	(0008,1155)	1C	Uniquely identifies the referenced SOP Instance
>Purpose of Referenced Code Sequence	(0040,A170)	3	Describes the purpose for which thereference is made. Only a single Itemshall be permitted in this sequence. Defined Context ID 7201.
>>Code Value	(0008,0100)	1C	Required if a sequence item is present
>>Code schema designator	(0008,0102)	1C	Required if a sequence item is present
>>Code meaning	(0008,0104)	1C	Required if a sequence item is present

Table 4-9: General Image Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
Acquisition plane	(0019,xxDE)	1C	Plane on which the current Image is acquired
patient position per image	(0019,xxC7)	3	Patient position descriptor relative to the equipment. Required for CT and MR images; shall not be present if Patient Orientation Code Sequence (0054,0410) is present; may be present otherwise. Defined terms are: • HFP = Head First-Prone • HFS = Head First-Supine • HFDR = Head First-Decubitus Right • HFDL = Head First-Decubitus Left • FFDR = Feet First-Decubitus Right • FFDL = Feet First-Decubitus Left • FFP = Feet First-Prone • FFS = Feet First-Supine

3.2.5.3 Image Pixel Module

This section specifies the Attributes that describe the pixel data of the image.

Table 4-10: Image Pixel Module Attributes

Attribute Name	Tag	Type	Attribute Description
Samples per Pixel	(0028,0002)	1	1
Photometric Interpretation	(0028,0004)	1	MONOCHROME1 or MONOCHROME2
Rows	(0028,0010)	1	Depends on the size of the FOV (imaged region of the X–ray detector), and the re– sampling applied during the DICOM conversion. Possible values are 608, 750, 800, 1000 and 512.
Columns	(0028,0011)	1	Depends on the size of the FOV (imaged region of the X–ray detector), and the re– sampling applied during the DICOM conversion. Possible values are 608, 750, 800, 1000 and 512.
Bits Allocated	(0028,0100)	1	8 or 16
Bits Stored	(0028,0101)	1	8 or 12
High Bit	(0028,0102)	1	7 or 11
Pixel Representation	(0028,0103)	1	0x0000
Pixel Data	(7FE0,0010)	1	Data stream of the pixel samples.

3.2.5.4 X-Ray Acquisition Module

Table 4-11: X-Ray acquisition Module Attributes

Attribute Name	Tag	Type	Attribute Description
kvp	(0018,0060)	2	Peak kilo voltage output of the Xray generator used

Table 4-11: X-Ray acquisition Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
Field of view dimension(s)	(0018,1149)	3	From user selection in the User Interface of the acquisition system. Possible values are "400\400" OR "320\320" OR "300\300" OR "200\200" OR OR "172\172" OR "170\170" OR "160\160" OR "150\150" OR "147\147" OR "121\121" OR "120\120"
X-Ray tube current	(0018,1151)	2C	NO value, Zero length

3.2.5.5 XA Positioner Module

Table 4-12: XA Positioner Module Attributes

Attribute Name	Tag	Type	Attribute Description
Distance source to detector	(0018,1110)	3	Internally generated by the acquisition system.
Distance source to patient	(0018,1111)	3	Internally generated by the acquisition system.
Positioner motion	(0018,1500)	2C	DYNAMIC if Pivot or C-ARM moves. If NO motion, or if L only moves, will be sent as STATIC.
Positioner Primary Angle	(0018,1510)	2	For multi-frame images, value of the first frame.
Positioner Secondary Angle	(0018,1511)	2	For multi-frame images, value of the first frame.

3.2.5.6 Curve Module

Table 4-13: Curve Module Attributes

Attribute Name	Tag	Type	Attribute Description
LV Diastolic contour	(0019,xx0C)	3	Diastolic contour image coordinates. Three or more pairs of values with the coordinates of the contour points [row and column - starting at 1,1] with respect to the origin (upper-left corner) of the pixel data.
LV Systolic contour	(0019,xx0D)	3	Systolic contour image coordinates. Three or more pairs of values with the coordinates of the contour points [row and column - starting at 1,1] with respect to the origin (upper-left corner) of the pixel data.

3.2.5.7 Common Lookup Table Modules

VOI LUT Module

This section specifies the Attributes that describe the VOI LUT.

Table 4-14: VOI LUT Module Attributes

Attribute Name	Tag	Type	Attribute Description
Window center	(0028,1050)	3	Value of the window center optimized at the image acquisition.

Table 4-14: VOI LUT Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
Window width	(0028,1051)	3	Value of the window width optimized at the image acquisition.
Default brightness contrast	(0019,xx4E)	3	The brightness/contrast applied by IPOpt to the VOI during the image acquisition
User brightness contrast	(0019,xx4F)	3	The brightness/contrast modified by the user to the VOI during the image review

Modality LUT Module

The Modality LUT module is not sent.

3.2.5.8 SOP Common Module

The SOP Common Module is mandatory for all DICOM IODs.

This section defines the Attributes which are required for proper functioning and identification of the associated SOP Instances. They do not specify any semantics about the Real–World Object represented by the IOD.

Table 4-15: SOP Common Module Attributes

Attribute Name	Tag	Type	Attribute Description
SOP Instance UID	(0008,0018)	1	Restricted to 64 characters, internally generated as follows: “registred prefix for GEMS” + “.2. registred identification of Innova System within GEMS” + “.a.b.c” encoded mac address of the DL host + “.x.y.z” unique id protected against reinstallation and reentrance.
SOP Class UID	(0008,0016)	1	1.2.840.10008.5.1.4.1.1.12.1
Specific Character Set	(0008,0005)	1C	ISO_IR 100

3.2.5.9 SC Modules

This Section describes SC Equipment, and Image Modules. These Modules contain Attributes that are specific to SC Image IOD.

SC Equipment Module

This Module describes equipment used to convert images into a DICOM format.

Table 4-16: SC Image Equipment Module Attributes

Attribute Name	Tag	Type	Attribute Description
Conversion type	(0008,0064)	1	“WSD”
SC manufacturer	(0018,1016)	3	“GE MEDICAL SYSTEMS”
SC manufacturer model name	(0018,0018)	3	“DL”

SC Image Module

The table in this Section contains IOD Attributes that describe SC images.

Table 4-17: SC Image Module Attributes

Attribute Name	Tag	Type	Attribute Description
Date of Secondary Capture	(0018,1012)	3	Date the SC image was captured
Time of Secondary Capture	(0018,1014)	3	Time the SC image was captured

3.2.5.10 Photo QCA Module

Table 4-18: Photo QCA Module Attributes

Attribute Name	Tag	Type	Attribute Description
Analysis Views	(0009,XX00)	1	Enumerated type containing one of the following values: PRE, POST and PRE_POST.
Segment	(0009,XX10)	2	ACC segment name. Defined terms: Proximal RCARCA OstiumMid RCADistal RCARight PDARight LV–BRLMCALMCA OstiumProximal LADMid LADDistal LAD1st Diagonal2nd Diagonal1st Septal- Proximal CircumflexMid Circumflex1st Marginal2nd Marginal3rd MarginalDistal CircumflexL
Pre Catheter Name	(0009,XX11)	2C	User description of pre–procedure catheter. Required if Analysis Type (0009,XX00) is ”PRE” or ”PRE_POST”. (May not be sent).
Pre Catheter Size	(0009,XX12)	1C	Size of pre–procedure catheter in millimeters. Required if Analysis Type (0009,XX00) is ”PRE” or ”PRE_POST”. (May not be sent).
Pre Reference Diameter	(0009,XX13)	1C	Pre–procedure Reference Diameter, in millimeters. Required if Analysis Type (0009,XX00) is ”PRE” or ”PRE_POST”. (May not be sent).
Pre Minimum Lumen Diameter	(0009,XX14)	1C	Pre–procedure Minimum Lumen Diameter, in millimeters. Required if Analysis Type (0009,XX00) is ”PRE” or ”PRE_POST”. (May not be sent).
Pre Average Diameter	(0009,XX15)	2C	Pre–procedure Average Diameter, in millimeters. Required if Analysis Type (0009,XX00) is ”PRE” or ”PRE_POST”. (May not be sent).
Pre Stenosis Length	(0009,XX16)	2C	Pre–procedure Stenosis Length, in millimeters. Required if Analysis Type (0009,XX00) is ”PRE” or ”PRE_POST”. (May not be sent).
Pre Stenosis %	(0009,XX17)	2C	Pre–procedure Stenosis as a percentage. Required if Analysis Type (0009,XX00) is ”PRE” or ”PRE_POST”. (May not be sent).
Pre Geometric Area Reduction %	(0009,XX18)	2C	Pre–procedure Geometric Area Reduction as a percentage. Required if Analysis Type (0009,XX00) is ”PRE” or ”PRE_POST”. (May not be sent).
Post Catheter Name	(0009,XX21)	2C	User description of post–procedure catheter. Required if Analysis Type (0009,XX00) is ”POST” or ”PRE_POST”. (May not be sent).
Post Catheter Size	(0009,XX22)	1C	Size of post–procedure catheter in millimeters. Required if Analysis Type (0009,XX00) is ”POST” or ”PRE_POST”. (May not be sent).
Post Reference Diameter	(0009,XX23)	1C	Post–procedure Reference Diameter, in millimeters. Required if Analysis Type (0009,XX00) is ”POST” or ”PRE_POST”. (May not be sent).
Post Minimum Lumen Diameter	(0009,XX24)	1C	Post–procedure Minimum Lumen Diameter, in millimeters. Required if Analysis Type (0009,XX00) is ”POST” or ”PRE_POST”. (May not be sent).

Table 4-18: Photo QCA Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
Post Average Diameter	(0009,XX25)	2C	Post–procedure Average Diameter, in millimeters. Required if Analysis Type (0009,XX00) is ”POST” or ”PRE_POST”. (May not be sent).
Post Stenosis Length	(0009,XX26)	2C	Post–procedure Stenosis Length, in millimeters. Required if Analysis Type (0009,XX00) is ”POST” or ”PRE_POST”. (May not be sent).
Post Stenosis %	(0009,XX27)	2C	Post–procedure Stenosis as a percentage. Required if Analysis Type (0009,XX00) is ”POST” or ”PRE_POST”. (May not be sent) .
Post Geometric Area Reduction %	(0009,XX28)	2C	Post–procedure Geometric Area Reduction as a percentage. Required if Analysis Type (0009,XX00) is ”POST” or ”PRE_POST”. (May not be sent).

3.2.5.11 Photo QVA Module

Table 4-19: Photo QVA Module Attributes

Attribute Name	Tag	Type	Attribute Description
Dodge End Diastolic Volume ml	(0009,xx60)	3	Dodge's End Diastolic Volume ml
Dodge End Systolic Volume ml	(0009,xx61)	3	Dodge's End Systolic Volume ml
Dodge Stroke Volume ml	(0009,xx62)	3	Dodge's Stroke Volume ml
Dodge Ejection Fraction	(0009,xx63)	3	Dodge's Ejection Fraction
Simspon End Diastolic Volume ml	(0009,xx64)	3	Simspon's End Diastolic Volume ml
Simspon End Systolic Volume ml	(0009,xx65)	3	Simspon's End Systolic Volume ml
Simspon Stroke Volume ml	(0009,xx66)	3	Simspon's Stroke Volume ml
= Simspon Ejection Fraction	0009,xx67)	3	Simspon's Ejection Fraction
CFX Single Hypokinesia in Region	(0009,xx68)	3	CFX Single Hypokinesia in Region
CFX Single Hyperkinesia in Opposite Region	(0009,xx69)	3	CFX Single Hyperkinesia in Opposite Region
CFX Single Total LV contour Percent	(0009,xx6A)	3	Desc for DCS = CFX Single Total LV contour Percent
CFX Multiple Hypokinesia in Region	(0009,xx6B)	3	CFX Multiple Hypokinesia in Region
CFX Multiple Hyperkinesia in Opposite Region	(0009,xx6C)	3	CFX Multiple Hyperkinesia in Opposite Region
CFX Multiple Total LV contour Percent	(0009,xx6D)	3	CFX Multiple Total LV contour Percent
RCA Single Hypokinesia in Region	(0009,xx6E)	3	RCA Single Hypokinesia in Region
RCA Single Hyperkinesia in Opposite Region	(0009,xx6F)	3	RCA Single Hyperkinesia in Opposite Region
RCA Single Total LV contour Percent	(0009,xx70)	3	RCA Single Total LV contour Percent
RCA Multiple Hypokinesia in Region	(0009,xx71)	3	RCA Multiple Hypokinesia in Region
RCA Multiple Hyperkinesia in Opposite Region	(0009,xx72)	3	RCA Multiple Hyperkinesia in Opposite Region
RCA Multiple Total LV contour Percent	(0009,xx73)	3	RCA Multiple Total LV contour Percent
LAD Single Hypokinesia in Region	(0009,xx74)	3	LAD Single Hypokinesia in Region

Table 4-19: Photo QVA Module Attributes (cont'd)

Attribute Name	Tag	Type	Attribute Description
LAD Single Hyperkinesia in Opposite Region	(0009,xx75)	3	LAD Single Hyperkinesia in Opposite Region
LAD Single Total LV contour Percent	(0009,xx76)	3	LAD Single Total LV contour Percent
LAD Multiple Hypokinesia in Region	(0009,xx77)	3	LAD Multiple Hypokinesia in Region
LAD Multiple Hyperkinesia in Opposite Region	(0009,xx78)	3	LAD Multiple Hyperkinesia in Opposite Region
LAD Multiple Total LV contour Percent	(0009,xx79)	3	LAD Multiple Total LV contour Percent
Dodge End Diastolic Volume ml/m2	(0009,xx7A)	3	Dodge's End Diastolic Volume ml_m2
Dodge End Systolic Volume ml/m2	(0009,xx7C)	3	Dodge's End Systolic Volume ml_m2
Dodge Stroke Volume ml/m2	(0009,xx7E)	3	Dodge's Stroke Volume ml_m2
Simspon End Diastolic Volume ml/m2	(0009,xx80)	3	Simspon's End Diastolic Volume ml_m2
Simspon End Systolic Volume ml/m2	(0009,xx82)	3	Simspon's End Systolic Volume ml_m2
Simspon Stroke Volume ml/m2	(0009,xx84)	3	Simspon's Stroke Volume ml_m2

4 Private Data Dictionary

Table 4-20: Private Creator Identification (GEMS_DL_STUDY_01)

Attribute Name	Tag	VR	VM
Study number	(0015,xx8F)	IS	1

Table 4-21: Private Creator Identification (GEMS_DL_IMG_01)

Attribute Name	Tag	VR	VM
Image file name	(0019,xx30)	LO	1
Source series number	(0019,xx50)	IS	1
Source image number	(0019,xx51)	IS	1
Source frame number	(0019,xx52)	IS	1
Acquisition plane	(0019,xxDE)	CS	1
Patient Position per Image	(0019,xxC7)	CS	1
Image flip	(0019,xx95)	CS	2
SID vector	(0019,xxBE)	FL	1-N
SOD vector	(0019,xxE9)	FL	1-N
LV Diastolic contour	(0019,xx0C)	FL	2-2N
LV Systolic contour	(0019,xx0D)	FL	2-2N
Default brightness contrast	(0019,xx4E)	DS	2
User brightness contrast	(0019,xx4F)	DS	2

Table 4-22: Private Creator Identification (DLX_SERIE_01)

Attribute Name	Tag	VR	VM
Angle value 1	(0019,xx01)	DS	1
Angle value 2	(0019,xx02)	DS	1
Angle value 3	(0019,xx03)	DS	1

Table 4-23: Private Creator Identification (QCA_RESULTS)

Attribute Name	Tag	VR	VM
Analysis Views	(0009,xx00)	CS	1
Segment	(0009,xx10)	LO	1
Pre Catheter Name	(0009,xx11)	LO	1
Pre Catheter Size	(0009,xx12)	DS	1
Pre Reference Diameter	(0009,xx13)	DS	1
Pre Minimum Lumen Diameter	(0009,xx14)	DS	1
Pre Average Diameter	(0009,xx15)	DS	1
Pre Stenosis Length	(0009,xx16)	DS	1
Pre Stenosis %	(0009,xx17)	IS	1

Table 4-23: Private Creator Identification (QCA_RESULTS) (cont'd)

Attribute Name	Tag	VR	VM
Pre Geometric Area Reduction %	(0009,xx18)	IS	1
Post Catheter Name	(0009,xx21)	LO	1
Post Catheter Size	(0009,xx22)	DS	1
Post Reference Diameter	(0009,xx23)	DS	1
Post Minimum Lumen Diameter	(0009,xx24)	DS	1
Post Average Diameter	(0009,xx25)	DS	1
Post Stenosis Length	(0009,xx26)	DS	1
Post Stenosis %	(0009,xx27)	IS	1
Post Geometric Area Reduction %	(0009,xx28)	IS	1

Table 4-24: Private Creator Identification (GEMS_QVA_PHOTO_01)

Attribute Name	Tag	VR	VM
Dodge End Diastolic Volume ml	(0009,xx60)	FL	1
Dodge End Systolic Volume ml	(0009,xx61)	FL	1
Dodge Stroke Volume ml	(0009,xx62)	FL	1
Dodge Ejection Fraction	(0009,xx63)	IS	1
Simspon End Diastolic Volume ml	(0009,xx64)	FL	1
Simspon End Systolic Volume ml	(0009,xx65)	FL	1
Simspon Stroke Volume ml	(0009,xx66)	FL	1
Simspon Ejection Fraction	(0009,xx67)	IS	1
CFX Single Hypokinesia in Region	(0009,xx68)	FL	1
CFX Single Hyperkinesia in Opposite Region	(0009,xx69)	FL	1
CFX Single Total LV contour Percent	(0009,xx6A)	IS	1
CFX Multiple Hypokinesia in Region	(0009,xx6B)	FL	1
CFX Multiple Hyperkinesia in Opposite Region	(0009,xx6C)	FL	1
CFX Multiple Total LV contour Percent	(0009,xx6D)	IS	1
RCA Single Hypokinesia in Region	(0009,xx6E)	FL	1
RCA Single Hyperkinesia in Opposite Region	(0009,xx6F)	FL	1
RCA Single Total LV contour Percent	(0009,xx70)	IS	1
RCA Multiple Hypokinesia in Region	(0009,xx71)	FL	1
RCA Multiple Hyperkinesia in Opposite Region	(0009,xx72)	FL	1
RCA Multiple Total LV contour Percent	(0009,xx73)	IS	1
LAD Single Hypokinesia in Region	(0009,xx74)	FL	1
LAD Single Hyperkinesia in Opposite Region	(0009,xx75)	FL	1
LAD Single Total LV contour Percent	(0009,xx76)	IS	1
LAD Multiple Hypokinesia in Region	(0009,xx77)	FL	1
LAD Multiple Hyperkinesia in Opposite Region	(0009,xx78)	FL	1
LAD Multiple Total LV contour Percent	(0009,xx79)	IS	1

Table 4-24: Private Creator Identification (GEMS_QVA_PHOTO_01) (cont'd)

Attribute Name	Tag	VR	VM
Dodge End Diastolic Volume ml/m2	(0009,xx7A)	FL	1
Simspon End Systolic Volume ml/m2	(0009,xx82)	FL	1

Table 4-25: Private Creator Identification (QUANTITATIVE_RESULTS)

Attribute Name	Tag	VR	VM
Number of Diseased Vessels	(0009,xx50)	IS	1
Hypokinesis in Region	(0009,xx51)	DS	1
Hyperkinesis in Opposite Region	(0009,xx52)	DS	1
Percent Total LV Hypokinesis	(0009,xx53)	IS	1
Calibration Factor	(0009,xx55)	DS	1

Chapter 5 Modality Worklist Information Model Definition

1 Introduction

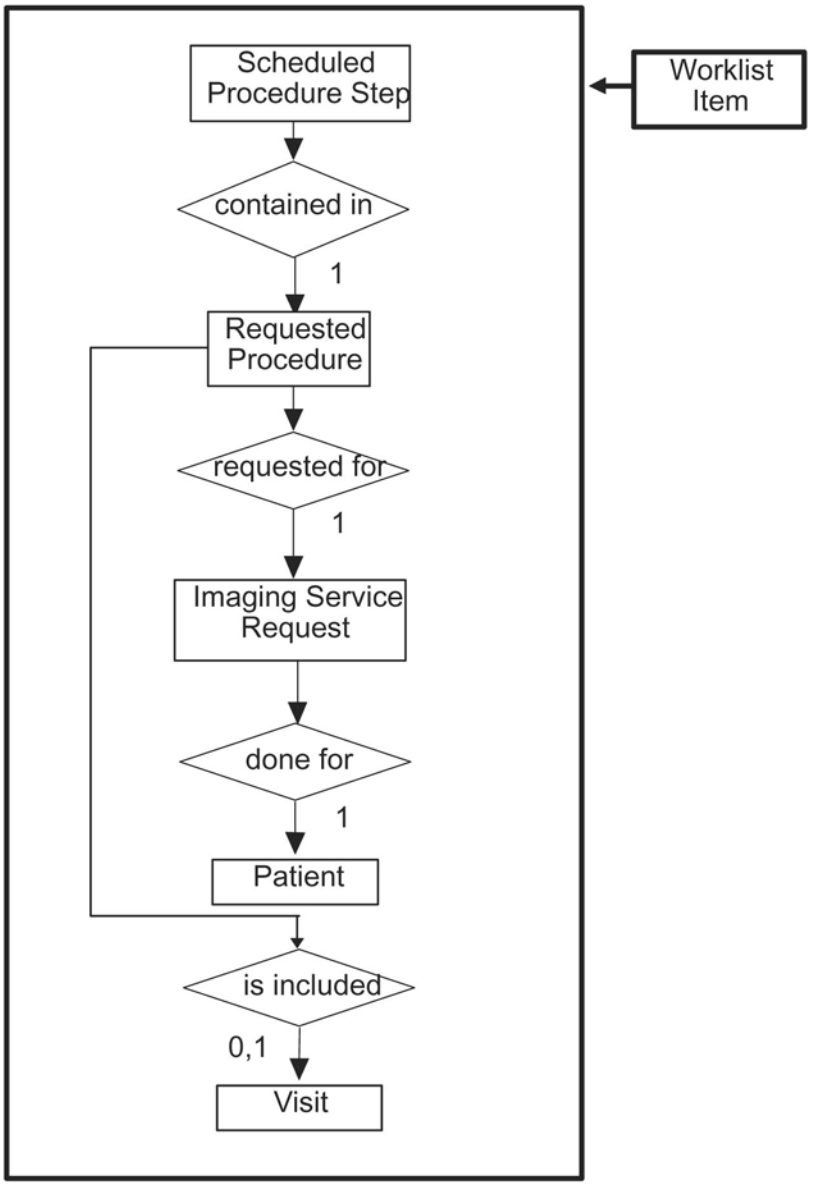
This section specifies the use of the DICOM Modality Worklist Information Model used to organize data and against which a Modality Worklist Query will be performed.

2 Modality Worklist Information Model Entity Relationship Model

The Entity–Relationship diagram for the Modality Worklist Information Model schema is shown in Illustration 5-1 . It represents the information that composes a Worklist Item. In this figure, the following diagrammatic convention is established to represent the information organization :

- Each entity is represented by a rectangular box.
- Each relationship is represented by a diamond shaped box..
- The fact that a relationship exists between two entities is depicted by lines connecting the corresponding entity boxes to the relationship boxes.

Illustration 5-1: Modality Worklist Information Model E/R DIAGRAM



2.1 Entity Descriptions

Please refer to DICOM Standard PS 3.3. (Information Object Definitions) and PS 3.4 (Service Class Specifications) for a description of each of the Entities contained within the Modality Worklist Information Model.

2.2 Innova Mapping of DICOM Entities

Table 5-1: Mapping of DICOM Entities to INNOVA Entities

DICOM	INNOVA Entity
Scheduled Procedure Step	
Requested Procedure	Exam
Imaging Service Request	Exam
Visit	
Patient	Patient

3 Information Model

3.1 Information Model Module Table

Within an entity of the DICOM v3.0 Modality Worklist Information Model, attributes are grouped into related set of attributes. A set of related attributes is termed a module. A module facilitates the understanding of the semantics concerning the attributes and how the attributes are related with each other. A module grouping does not infer any encoding of information into datasets.

The table in this section identifies the defined modules within the entities which comprise the DICOM v3.0 Modality Worklist Information Model. Modules are identified by Module Name.

See DICOM v3.0 PS 3.3 and PS 3.4 for a complete definition of the entities, modules, and attributes.

Table 5-2: Modality Worklist Information Model Modules

Entity Name	Module Name	Reference
Scheduled Procedure Step	SOP Common	Section 3.2.2.2
	Scheduled Procedure Step	Section 3.2.2.3
Requested Procedure	Requested Procedure	Section 3.2.3.2
Imaging Service Request	Imaging Service Request	Section 3.2.4.2
Visit	Visit Identification	Section 3.2.5.2
	Visit Status	Section 3.2.5.3
	Visit Relationship	Section 3.2.5.4
	Visit Admission	Section 3.2.5.5
Patient	Patient Relationship	Section 3.2.6.2
	Patient Identification	Section 3.2.6.3
	Patient Demographic	Section 3.2.6.4
	Patient Medical	Section 3.2.6.5

3.2 Information Model Keys

Please refer to DICOM Standard PS 3.3. (Information Object Definitions) and PS 3.4 (Service Class Specifications) for a description of each of the Entities contained within the Modality Worklist Information Model. The following Module descriptions are included to specify what data elements are supported and what type of matching can be applied. It should be noted that they are the same ones as defined in the DICOM v3.0 Standard PS 3.4 (Service Class Specifications).

3.2.1 Supported Matching

Following are the types of matching that can be request by the implementation :

- Single Value matching
- Universal Matching
- Wild Card Matching
- Range of date, Range of Time

3.2.2 Scheduled Procedure Step Entity

3.2.2.1 Introduction

This section describes the modules of Scheduled Procedure Step Entity.

3.2.2.2 SOP Common Module

Table 5-3: SOP Common Module Attributes

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into the Image	Note
Specific Character Set	(0008,0005)	O	1C	No	Matching on this tag is not supported. ISO IR_100 is always assumed.

3.2.2.3 Scheduled Procedure Step Module

Table 5-4: Scheduled Procedure Step Module Attributes

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into the Image	Note
Scheduled Procedure Step Sequence	(0040,0100)	R	1	No	
>Scheduled Station AE Title	(0040,0001)	R	1	No	Matching is supported. The matching value is the AE– Title of the Innova system.
>Scheduled Procedure Step Start Date	(0040,0002)	R	1	No	Matching value can be configured for date or date range.
>Scheduled Procedure Step Start Time	(0040,0003)	R	1	No	Requested, zero length.
>Modality	(0008,0060)	R	1	No	This is requested either as zero length or as XA, user configurable.
>Scheduled Performing Physician's Name	(0040,0006)	R	2	Yes	Requested, zero length. After user confirmation, the first value can be mapped into Performing Physician (0008, 1050)
>Scheduled Procedure Step Description	(0040,0005)	O	1C	No	After user confirmation, can be mapped into Study description (0008, 1030)
>Scheduled Action Item Code Sequence	(0040,0008)	O	1C	No	
>>Code Value	(0008,0100)	O	1C	No	
>>Coding Scheme Designator	(0008,0102)	O	1C	No	

Table 5-4: Scheduled Procedure Step Module Attributes (cont'd)

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into the Image	Note
>>Code Meaning	(0008,0104)	O	3	No	
>Scheduled Procedure Step ID	(0040,0009)	O	1	No	

3.2.3 Requested Procedure Entity

3.2.3.1 Introduction

This section describes the modules of Requested Procedure Entity.

3.2.3.2 Requested Procedure Module

Table 5-5: Requested Procedure Module Attributes

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into the Image	Note
Requested Procedure ID	(0040,1001)	O	1	Yes	This information can be mapped into Study ID (0020,0010) after user confirmation.
Requested Procedure Description	(0032,1060)	O	1C	No	
Requested Procedure Code Sequence	(0032,1064)	O	1C	No	
>Code Value	(0008,0100)	O	1C	No	
>Coding Scheme Designator	(0008,0102)	O	1C	No	
>Code Meaning	(0008,0104)	O	3	No	
Study Instance UID	(0020,000D)	O	1	Yes	If one SPS is selected, or if multiple SPSs with the same Study Instance UID are selected, the value is mapped in the images. Else, a Study Instance UID is generated by the implementatoin.
Referenced Study Sequence	(0008,1110)	O	2	No	
>Referenced SOP Class UID	(0008,1150)	O	1C	No	
>Referenced SOP Instance UID	(0008,1155)	O	1C	No	

3.2.4 Imaging Service Request Entity

3.2.4.1 Introduction

This section describes the modules of Imaging Service Request Entity.

3.2.4.2 Imaging Service Request Module

Table 5-6: Imaging Service Request Module Attributes

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into the Image	Note
Accession Number	(0008,0050)	O	2	Yes	Matching is supported, user entered value is sent.
Referring Physician's Name	(0008,0090)	O	2	Yes	Requested, zero length. The first person name component group is mapped in the image. No truncation is performed. Values may be trucnated for display only.

3.2.5 Visit Entity

3.2.5.1 Introduction

This section describes the modules of Visit Entity.

3.2.5.2 Visit Identification Module

Table 5-7: Visit Identification Module Attribute

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into the Image	Note
Admission ID	(0038,0010)	O	2	Yes	

3.2.5.3 Visit Status Module

No attribute from this module is requested in the modality worklist query.

3.2.5.4 Visit Relationship Module

No attribute from this module is requested in the modality worklist query.

3.2.5.5 Visit Admission Module

No attribute from this module is requested in the modality worklist query.

3.2.6 Patient Entity

3.2.6.1 Introduction

This section describes the modules of Patient Entity.

3.2.6.2 Patient Relationship Module

No attribute from this module is requested in the modality worklist query.

3.2.6.3 Patient Identification Module

Table 5-8: Patient Identification Module Attributes

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into the Image	Note
Patient's Name	(0010,0010)	R	1	Yes	Matching is supported, user entered value is sent. Wildcards are appened in the query at the end of the components (first name and last name). The first person name component group returned is mapped in the image. No truncation is performed. Values may be trucnated for display only
Patient ID	(0010,0020)	R	1	Yes	Matching is supported, user entered value is sent.

3.2.6.4 Patient Demographic Module

Table 5-9: Patient Demographic Module Attributes

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into the Image	Note
Patients Birth Date	(0010,0030)	O	2	Yes	
Patient's Sex	(0010,0040)	O	2	Yes	
Patient's Weight	(0010,1030)	O	2	Yes	
Patient's Size	(0010,1020)	O	3	Yes	

3.2.6.5 Patient Medical Module

No attribute from this module is requested in the modality worklist query.

4 Private Data Dictionary

No private data dictionary is used by the worklist implementation.

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Chapter 6 Storage Commitment Push Model Implementation

1 Storage commitment push model information object definition

1.1 Introduction

The Storage Commitment Information Object is used both for N–ACTION Storage Commitment Requests by the SCU and N–EVENT–REPORT Storage Commitment Notifications by the SCP

1.2 Storage Commitment Module for N-Action

The INNOVA uses the DIMSE service element N–ACTION to send the Storage Commitment request.

The INNOVA supports the following data elements in the part of data set of the N–ACTION request:

Table 6-1: Storage Commitment Module for N-Action-RQ

Attribute Name	Tag	AE Use
Transaction UID	(0008,1195)	Restricted to 64 characters, internally generated as follows:"registered prefix for GEMS" + ".2" Registered prefix of Innova System within GEMS + ".a.b.c" encoded mac address of the DL host +".x.y.z" unique id protected against reinstallation and re–en-trance
Storage Media File–Set ID	(0088,0130)	Not used
Storage Media File–Set UID	(0088,0140)	Not used
Referenced SOP Sequence	(0008,1199)	
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	
>Storage Media File–Set ID	(0088,0130)	Not used
>Storage Media File–Set UID	(0088,0140)	Not used

1.3 Storage Commitment Module for N-Event-Report

The INNOVA uses the DIMSE service element N–EVENT–REPORT to receive a Storage Commitment response.

The INNOVA supports the following data elements in the part of data set in a received N–EVENT–REPORT request:

Table 6-2: Storage Commitment Module for N-Event-Report-RQ

Attribute Name	Tag	AE Use
Transaction UID	(0008,1195)	Not used
Retrieve AE Title	(0008,0054)	Not used
Storage Media File–Set ID	(0088,0130)	Not used
Storage Media File–Set UID	(0088,0140)	Not used
Referenced SOP Sequence	(0008,1199)	The AE considers the SOP Instances referenced by this sequence as successfully archived.
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	
>Retrieve AE Title	(0008,0054)	Not used
>Storage Media File–Set ID	(0088,0130)	Not used
>Storage Media File–Set UID	(0088,0140)	Not used
Failed SOP Sequence	(0008,1198)	The AE considers the SOP Instances referenced by this sequence as not archived; the application will display an error status in the network queue.
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	
>Failure Reason	(0008,1197)	The failure reason is logged in the application error log.

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