

GE Healthcare

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Optiam EMS
English
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The document part number and revision appear at the bottom of each page. The revision identifies the document's update level. The revision history of this document is summarized in the following table.

Revision	Date	Comments
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Service Manual Language Information

WARNING (EN)	This service manual is available in English only. <ul style="list-style-type: none">• If a customer's service provider requires a language other than English, it is the customer's responsibility to provide translation services.• Do not attempt to service the equipment unless this service manual has been consulted and is understood.• Failure to heed this warning may result in injury to the service provider, operator, or patient, from electric shock, mechanical or other hazards.
ПРЕДУПРЕЖДЕНИЕ (BG)	Това упътване за работа е налично само на английски език. <ul style="list-style-type: none">• Ако доставчикът на услугата на клиента изиска друг език, 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。 <ul style="list-style-type: none">• 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。
警告 (ZH-TW)	本維修手冊只提供英文版。 <ul style="list-style-type: none">• 如果客戶的維修人員有英語以外的其他語言版本需求，則由該客戶負責 提供翻譯服務。• 除非您已詳閱本維修手冊並了解其內容，否則切勿嘗試對本設備進行維修。• 不重視本警告可能導致維修人員、操作人員或病患因電擊、機械因素或 其他因素而受到傷害。

Service Manual Language Information (cont'd.)

UPOZORENJE (HR)	<p>Ove upute za servisiranje dostupne su samo na engleskom jeziku.</p> <ul style="list-style-type: none"> • Ukoliko korisnički servis zahtijeva neki drugi jezik, korisnikova je odgovornost osigurati odgovarajući prijevod. • Nemojte pokušavati servisirati opremu ukoliko niste konzultirali i razumjeli ove upute. • Nepoštivanje ovog upozorenja može rezultirati ozljedama servisnog osoblja, korisnika ili pacijenta prouzročenim električnim udarom te mehaničkim ili nekim drugim opasnostima.
VAROVÁNÍ (CS)	<p>Tento provozní návod existuje pouze v anglickém jazyce.</p> <ul style="list-style-type: none"> • 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 varování může dojít k poranění pracovníka prodejního servisu, obslužného personálu nebo pacientů vlivem elektrického proudu, respektive vlivem mechanických či jiných rizik.
ADVARSEL (DA)	<p>Denne servicemanual findes kun på engelsk.</p> <ul style="list-style-type: none"> • 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)	<p>Deze service manual is alleen in het Engels verkrijgbaar.</p> <ul style="list-style-type: none"> • Indien het onderhoudspersoneel een andere taal nodig heeft, dan is de klant verantwoordelijk voor de vertaling ervan. • Probeer de apparatuur niet te onderhouden voordat deze service manual geraadpleegd en begrepen is. • Indien deze waarschuwing niet wordt opgevolgd, zou het onderhoudspersoneel, de gebruiker of een patiënt gewond kunnen raken als gevolg van een elektrische schok, mechanische of andere gevaren.
HOIATUS (ET)	<p>Käesolev teenindusjuhend on saadaval ainult inglise keeles.</p> <ul style="list-style-type: none"> • Kui klienditeeninduse osutaja nõuab juhendit inglise keelest erinevas keeles, vastutab klient tõlketeenuse osutamise eest. • Ärge üritage seadmie teenindada enne eelnevalt käesoleva teenindusjuhendiga tutvumist ja sellest aru saamist. • Käesoleva hoiatuse eiramise võib põhjustada teenuseosutaja, operaatori või patsiendi vigastamist elektrilöögi, mehaanilise või muu ohu tagajärvel.
VAROITUS (FI)	<p>Tämä huolto-ohje on saatavilla vain englanniksi.</p> <ul style="list-style-type: none"> • Jos asiakkaan huoltohenkilöstö vaatii muuta kuin englanninkielistä materiaalia, tarvittavan käänöksen hankkiminen on asiakkaan vastuulla. • Älä yritä korjata laitteistoa ennen kuin olet varmasti lukenut ja ymmärtänyt tämän huolto-ohjeen. • Mikäli tästä varoitusta ei noudateta, seurauksena voi olla huoltohenkilöstön, laitteiston käyttäjän tai potilaan vahingoittuminen sähköiskun, mekaanisen vian tai muun vaaratilanteen vuoksi.

Service Manual Language Information (cont'd.)

ATTENTION (FR)	<p>Ce manuel technique n'est disponible qu'en anglais.</p> <ul style="list-style-type: none"> • Si un service technique client souhaite obtenir ce manuel dans une autre langue que l'anglais, il devra prendre en charge la traduction et la responsabilité du contenu. • Ne pas tenter d'intervenir sur les équipements tant que le manuel technique n'a pas été consulté et compris. • Le non-respect de cet avertissement peut entraîner chez le technicien, l'opérateur ou le patient des blessures dues à des dangers électriques, mécaniques ou autres.
WARNUNG (DE)	<p>Diese Serviceanleitung ist nur in englischer Sprache verfügbar.</p> <ul style="list-style-type: none"> • Falls der Kundendienst eine andere Sprache benötigt, muss er für eine entsprechende Übersetzung sorgen. • Keine Wartung durchführen, ohne diese Serviceanleitung gelesen und verstanden zu haben. • Bei Zu widerhandlung kann es zu Verletzungen des Kundendiensttechnikers, des Anwenders oder des Patienten durch Stromschläge, mechanische oder sonstige Gefahren kommen.
ΠΡΟΕΙΔΟΠΟΙΗΣΗ (GR)	<p>Το παρόν εγχειρίδιο σέρβις διατίθεται στα αγγλικά μόνο.</p> <ul style="list-style-type: none"> • Εάν το άτομο παροχής σέρβις ενός πελάτη απαιτεί το παρόν εγχειρίδιο σε γλώσσα εκτός των αγγλικών, αποτελεί ευθύνη του πελάτη να παρέχει υπηρεσίες μετάφρασης. • Μην επιχειρήσετε την εκτέλεση εργασιών σέρβις στον εξοπλισμό εκτός εάν έχετε συμβουλευτεί και έχετε κατανοήσει το παρόν εγχειρίδιο σέρβις. • Εάν δεν λάβετε υπόψη την προειδοποίηση αυτή, ενδέχεται να προκληθεί τραυματισμός στο άτομο παροχής σέρβις, στο χειριστή ή στον ασθενή από ηλεκτροπληξία, μηχανικούς ή άλλους κινδύνους.
FIGYELMEZTETÉS (HU)	<p>Ez a szerviz kézikönyv kizárolag angol nyelven érhető el.</p> <ul style="list-style-type: none"> • Ha a vevő szerviz ellátója angoltól eltérő nyelvre tart igényt, akkor a vevő felelőssége a fordítás elkészítetése. • Ne próbálja elkezdeni használni a berendezést, amíg a szerviz kézikönyvben leírtakat nem értelmezték és értették meg. • Ezen figyelmeztetés figyelmen kívül hagyása a szerviz ellátó, a működtető vagy a páciens áramütés, mechanikai vagy egyéb veszélyhelyzet miatti sérülését eredményezheti.
ÁDVÖRUN (IS)	<p>Þessi þjónustuhandbók er eingöngu fáanleg á ensku.</p> <ul style="list-style-type: none"> • Ef öð þjónustuveitandi viðskiptamanns þarfnað annars tungumáls en ensku, er það skylda viðskiptamanns að skaffa tungumálþjónustu. • Reynið ekki að afgreiða tækið nema þessi þjónustuhandbók hefur verið skoðuð og skilin. • Brot á að sinna þessari aðvörun getur leitt til meiðsla á þjónustuveitanda, stjórnda eða sjúklingi frá raflosti, vélrænum eða öðrum áhættum.
PERINGATAN (ID)	<p>Manual servis ini hanya tersedia dalam bahasa Inggris.</p> <ul style="list-style-type: none"> • Jika penyedia jasa servis pelanggan memerlukan bahasa lain selain dari Bahasa Inggris, merupakan tanggung jawab dari penyedia jasa servis tersebut untuk menyediakan terjemahannya. • Jangan mencoba melakukan servis terhadap perlengkapan kecuali telah membaca dan memahami manual servis ini. • Mengabaikan peringatan ini bisa mengakibatkan cedera pada penyedia servis, operator, atau pasien, karena terkena kejut listrik, bahaya mekanis atau bahaya lainnya.

Service Manual Language Information (cont'd.)

AVVERTENZA (IT)	<p>Il presente manuale di manutenzione è disponibile soltanto in Inglese.</p> <ul style="list-style-type: none"> • Se un addetto alla manutenzione richiede il manuale in una lingua diversa, il cliente è tenuto a provvedere direttamente alla traduzione. • Si proceda alla manutenzione dell'apparecchiatura solo dopo aver consultato il presente manuale ed averne compreso il contenuto. • 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)	<p>このサービスマニュアルは英語版しかありません。</p> <ul style="list-style-type: none"> • 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、十分に理解をした上で装置のサービスを行ってください。 • この警告に従わない場合、サービスを担当される方、操作員あるいは患者が、感電や機械的又はその他の危険により負傷する可能性があります。
경고 (KO)	<p>본 서비스 지침서는 영어로만 이용하실 수 있습니다.</p> <ul style="list-style-type: none"> • 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)	<p>Šī apkalpotāju rokasgrāmata ir pieejama tikai angļu valodā.</p> <ul style="list-style-type: none"> • Ja apkalpošanas sniedzējam nepieciešama informācija citā, nevis angļu, valodā, klienta pienākums ir nodrošināt tās tulkošanu. • Neveiciet aprīkojuma apkopi, neizlasot un nesaprotot apkalpotāju rokasgrāmatu. • Šī brīdinājuma neievērošana var radīt elektriskās strāvas trieciena, mehānisku vai citu risku izraisītu traumu apkopes sniedzējam, operatoram vai pacientam.
ISPĖJIMAS (LT)	<p>Šis ekspluatavimo vadovas yra prieinamas tik angļų kalba.</p> <ul style="list-style-type: none"> • Jei kliento paslaugų tiekėjas reikalauja vadovo kita kalba - ne angļų, numatyti vertimo paslaugas yra kliento atsakomybė. • Nemieginkite atlirkinti įrangos techninės priežiūros, nebent atsižvelgėte į šį ekspluatavimo vadovą ir jį supratote. • Jei neatkreipsite dėmesio į šį perspėjimą, galimi sužalojimai dėl elektros šoko, mechaninių ar kitų paslaugų tiekėjui, operatoriui ar pacientui.
ADVARSEL (NO)	<p>Denne servicehåndboken finnes bare på engelsk.</p> <ul style="list-style-type: none"> • 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.

Service Manual Language Information (cont'd.)

OSTRZEŻENIE (PL)	<p>Niniejszy podręcznik serwisowy dostępny jest jedynie w języku angielskim.</p> <ul style="list-style-type: none"> Jeśli dostawca usług klienta wymaga języka innego niż angielski, zapewnienie usługi tłumaczenia jest obowiązkiem klienta. Nie należy 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.
AVISO (PT-BR)	<p>Este manual de assistência técnica só se encontra disponível em inglês.</p> <ul style="list-style-type: none"> Se o serviço de assistência técnica do cliente não for GE, e precisar de outro idioma, será da responsabilidade do cliente fornecer os serviços de tradução. Não tente reparar o equipamento sem ter consultado e compreendido este manual de assistência técnica. O não cumprimento deste aviso pode por em perigo a segurança do técnico, operador ou paciente devido a choques elétricos, mecânicos ou outros.
AVISO (PT-PT)	<p>Este manual técnico só se encontra disponível em inglês.</p> <ul style="list-style-type: none"> Se a assistência técnica do cliente 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 técnico. O não cumprimento deste aviso pode provocar lesões ao técnico, ao utilizador ou ao paciente devido a choques eléctricos, mecânicos ou outros.
AVERTISMENT (RO)	<p>Acest manual de service este disponibil numai în limba engleză.</p> <ul style="list-style-type: none"> 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 înțelegerei 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.
ПРЕДУПРЕЖДЕНИЕ (RU)	<p>Настоящее руководство по обслуживанию предлагается только на английском языке.</p> <ul style="list-style-type: none"> Если сервисному персоналу клиента необходимо руководство не на английском, а на каком-то другом языке, клиенту следует обеспечить перевод самостоятельно. Прежде чем приступить к обслуживанию оборудования, обязательно обратитесь к настоящему руководству и внимательно изучите изложенные в нем сведения. Несоблюдение требований данного предупреждения может привести к тому, что специалисты по обслуживанию, операторы или пациенты получат удар электрическим током, механическую травму или другое повреждение.
UPOZORENJE (SR)	<p>Ovo servisno uputstvo je dostupno samo na engleskom jeziku.</p> <ul style="list-style-type: none"> Ako klijentov serviser zahteva neki drugi jezik, klijent je dužan da obezbedi prevodilačke usluge. Ne pokušavajte da opravite uređaj ako niste pročitali i razumeli ovo servisno uputstvo. Zanemarivanje ovog upozorenja može dovesti do povređivanja servisera, rukovaoca ili pacijenta usled strujnog udara, ili mehaničkih i drugih opasnosti.

Service Manual Language Information (cont'd.)

VAROVANIE (SK)	<p>Tento návod na obsluhu je k dispozícii len v angličtine.</p> <ul style="list-style-type: none"> • 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 obsluhu a neporozumiete mu. • Zanedbanie tohto varovania môže vyúsiť do zranenia poskytovateľa služieb, obsluhujúcej osoby alebo pacienta elektrickým prúdom, mechanickým alebo iným nebezpečenstvom.
OPOZORILO (SL)	<p>Ta servisni priročnik je na voljo samo v angleškem jeziku.</p> <ul style="list-style-type: none"> • Če ponudnik storitve stranke potrebuje priročnik v drugem jeziku, mora stranka zagotoviti prevod. • Ne poskušajte servisirati opreme, če tega priročnika niste v celoti prebrali in razumeli. • Če tega opozorila ne upoštevate, se lahko zaradi električnega udara, mehanskih ali drugih nevarnosti poškoduje ponudnik storitev, operater ali bolnik.
ADVERTENCIA (ES)	<p>Este manual de servicio sólo existe en inglés.</p> <ul style="list-style-type: none"> • Si el encargado de mantenimiento de un cliente necesita un idioma que no sea el inglés, el cliente deberá encargarse de la traducción del manual. • No se deberá dar servicio técnico al equipo, sin haber consultado y comprendido este manual de servicio. • La no observancia del presente aviso puede dar lugar a que el proveedor de servicios, el operador o el paciente sufran lesiones provocadas por causas eléctricas, mecánicas o de otra naturaleza.
VARNING (SV)	<p>Den här servicehandboken finns bara tillgänglig på engelska.</p> <ul style="list-style-type: none"> • 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 förstått 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.
UYARI (TR)	<p>Bu servis kılavuzunun sadece İngilizcesi mevcuttur.</p> <ul style="list-style-type: none"> • Eğer müşteri teknisyeni bu kılavuzu İngilizce dışında bir başka lisandan talep ederse, bunu tercüme ettirmek müşteriye düşer. • Servis kılavuzunu okuyup anlamadan ekipmanlara müdahale etmeyiniz. • Bu uyarıyla uyulmaması, elektrik, mekanik veya diğer tehlikelerden dolayı teknisyen, operatör veya hastanın yaralanmasına yol açabilir.

Service Manual Language Information (cont'd.)

ЗАСТЕРЕЖЕННЯ (UK)	<p>Дане керівництво з сервісного обслуговування постачається виключно англійською мовою.</p> <ul style="list-style-type: none"> • Якщо сервісний інженер потребує керівництво іншою мовою, користувач зобов'язаний забезпечити послуги перекладача. • Не намагайтесь здійснювати технічне обслуговування даного обладнання, якщо ви не читали, або не зрозуміли інформацію, надану в керівництві з сервісного обслуговування. • Недотримання цього застереження може привести до травмування сервісного інженера, користувача даного обладнання або пацієнта внаслідок електричного шоку, механічного ушкодження або з інших причин невірного обслуговування обладнання.
CẢNH BÁO (VI)	<p>Tài Liệu Hướng Dẫn Sửa Chữa chỉ có bản tiếng Anh.</p> <ul style="list-style-type: none"> • Nếu các đơn vị cung cấp dịch vụ cho khách hàng yêu cầu một ngôn ngữ nào khác tiếng Anh, thì khách hàng sẽ có trách nhiệm cung cấp các dịch vụ dịch thuật. • Không được sửa chữa thiết bị trừ khi đã tham khảo và hiểu Tài liệu Hướng dẫn Sửa chữa. • Không tuân thủ những cảnh báo này có thể dẫn đến các tổn thương cho người thực hiện sửa chữa, người vận hành hay bệnh nhân, do sốc điện, các rủi ro về cơ khí hay các rủi ro khác.

Contents

1	Introduction	
	Manual Information	11
	Intended Audience	11
	Manual Purpose	11
	Document Conventions	11
	Additional Assistance.....	12
2	HL7 Inbound	
	Mapping HL7 Messages to the Optimal EMS HL7 Interface	14
	Site HL7 configuration	14
	ADT Message Handler Configuration	17
	ORM Message Handler Configuration	18
	OMG Message Handler Configuration	19
	Enabling the system HL7 Inbound	20
	Configuring the System HL7 Service Entry.....	21
3	Non-HL7 Inbound	
	IsPatientExisted	23
	AdmitPatient.....	24
	UpdatePatient.....	25
	MergePatient.....	25
	CreateOrder	26
4	HIS/EMR Outbound	
	Activating the System HIS/EMR Outbound	27
	Customizing HIS/EMR Outbound File Name Rules	30
	Creating A C# Class Library Project	30
	Adding MacitHooks.dll Reference	33
	Adding A New Class Named CustomizeOutBoundFiler.....	34
	Implementing IHisOutboundFileNameStrategy Interface in CustomizeOutBoundFiler Class	36
	Building C# dll Library Project	37
	Releasing Assembly dll File to the System Server	38

1

Introduction

This chapter provides general information required for the proper use of the system and this manual. Familiarize yourself with this information before using the system.

Manual Information

This section provides information for the correct use of this manual.

Keep this manual with the equipment at all times and periodically review it. You should request training assistance from GE Healthcare, if needed.

Intended Audience

This manual is intended for use by anyone responsible for integrating the Optima EMS system (also referred to as "the system" throughout this manual) and the HIS/EMR system.

Manual Purpose

This manual details the description of the data flow between the system and HIS/EMR. It describes how to integrate with these systems.

Document Conventions

This manual uses the following conventions.

Typographical Conventions

Convention	Description
Bold Text	Indicates keys on the keyboard, text to enter, or hardware items such as buttons or switches on the equipment.
<i>Italicized-Bold</i> Text	Indicates software terms that identify menu items, buttons or options in various windows.
CTRL+ESC	Indicates a keyboard operation. A plus (+) sign between the names of two keys indicates that while holding the first key, you should press and release the second key. For example, Press CTRL+ESC means to press and hold the CTRL key and then press and release the ESC key.

Convention	Description
<space>	Indicates that you must press the spacebar. When instructions are given for typing a precise text string with one or more spaces, the point where you must press the spacebar is indicated as <space>. This ensures that the correct number of spaces is inserted in the correct positions within the literal text string. The purpose of the < > brackets is to distinguish the command from the literal text within the string.
Enter	Indicates that you must press the Enter or Return key on the keyboard. Do not type Enter .
>	The greater than symbol, or right angle bracket, is a concise method to indicate a sequence of menu selections. For example, the statement "From the main menu, select System > Setup > Options to open the Option Activation window" replaces the following: <ol style="list-style-type: none"> 1. From the main menu, select System to open the System menu. 2. From the System menu, select Setup to open the Setup menu. 3. From the Setup menu, select Options to open the Option Activation window.

Illustrations

All illustrations in the manual are provided as examples only. Depending on system configuration, screens in the manual may differ from the screens on your system.

All patient names and data are fictitious. Any similarity to actual persons is coincidental.

Notes

Notes provide application tips or additional information that, while useful, are not essential to the correct operation of the system. They are called out from the body text through a flag word and indentation, as follows:

NOTE:

The tip or additional information is indented below the **NOTE** flag word.

Additional Assistance

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

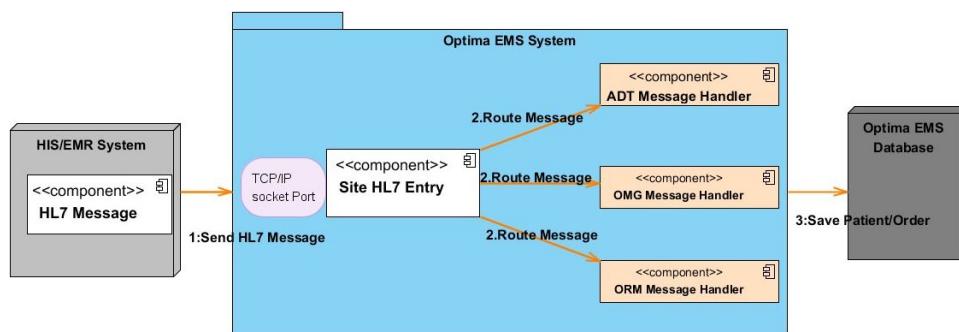
Contact your local GE Healthcare representative to request additional assistance.

2

HL7 Inbound

The system supports HL7 interfaces to accept ADT, OMG, and Order messages from the Hospital Information System and Electronic Medical Record (HIS/EMR). You must enable the appropriate HIS options (ADT, Orders) in the system.

The following diagram depicts a typical production deployment environment for HIS/EMR and the system.



The system receives the inbound ADT, OMG, and Order (ORM) HL7 messages from external systems (HIS/EMR) and routes them to the HL7 service entry of a special site.

The data transfer from HIS/RMR to the system is done using TCP/IP socket-based communication protocol. A pre-defined HL7 message format is used to route data.

The following HL7 event types are supported by the system HL7 Interface for HL7 messages

Supported HL7 event	Sub-event	Supported HL7 version	Supported (Optima EMS) workflow function	Definition
ADT	A01	2.3, 2.3.1 2.4 2.5 2.5.1	Admit patient	Patient is admitted.
ADT	A08	2.3, 2.3.1 2.4 2.5 2.5.1	Update patient information	Patient data has changed.

ADT	A39	2.3, 2.3.1 2.4 2.5 2.5.1	Merge patient	Patient is merged.
ADT	A40	2.3, 2.3.1 2.4 2.5 2.5.1	Merge patient	Patient is merged.
ORM	O01	2.3, 2.3.1 2.4 2.5 2.5.1	Create order	An order is created.
OMG	O19	2.3, 2.3.1 2.4 2.5 2.5.1	Create order	An order is created.

All other HL7 messages and versions are unsupported and will be discarded by the HL7 interface. When an unsupported HL7 message or version is sent to the system HL7 interface, an unsupported message is logged.

Mapping HL7 Messages to the Optimal EMS HL7 Interface

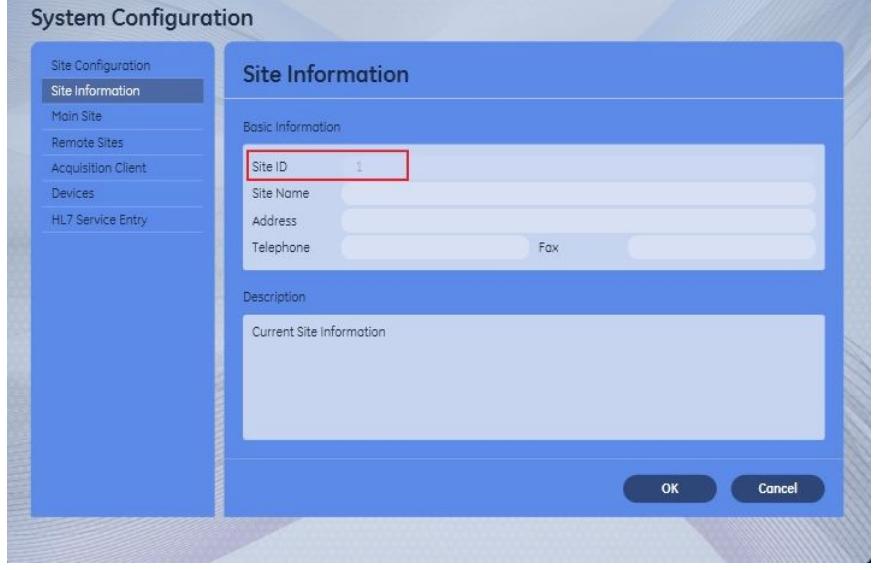
Each centricity hospital in Optimal EMS will configure the HL7 interface to meet the needs of the HIS/EMR systems.

The system provides a configuration file to meet the HL7 interface route and parse HL7 messages. The configuration file name is **hl7_mapping_config.xml** located at the default folder at **C:\Program Files\GE HealthCare\OptimaEMSService**.

Site HL7 configuration

Each centricity hospital has a configuration file with five attributes to configure as indicated in the following table.

Attribute name	Description
Name	The name of the centricity hospital.
ID¹	The site ID of the centricity hospital in the system..
ECG Keyword	The order type description in the HL7 message. If HL7 order (ORM) messages contain this word, The system will mark this order as an ECG order.
Stress Keyword	Similar to the ECG Keyword , the system will mark this order as a stress order.

Holter Keyword	Similar to the ECG Keyword , the system will mark this order as a Holter order.
<p>¹ Obtain the configuration file ID value from the system as follows:</p> <ol style="list-style-type: none"> 1. Open the Site Information window by clicking System Configuration > Site Configuration. 2. The Site ID is listed in the Site ID field of Basic Information. 	

Message Handler Component Interfaces

The system HL7 Interface consists of three message handler component interfaces:

- **ADT**
- **ORM**
- **OMG**

Each HL7 message handler has an associated configuration in the configuration file. It gets configured according to various HIS.

Each HL7 message handler configuration is composed of one or two group sub-sections, and each group has multiple mapping parts. A mapping parts has three attributes.

Key Attribute

The **key** is universally pre-defined and cannot be changed. The keys are mapped are as indicated in the following table.

key definition

Key	Mapped
100	PID of patient
101	Family Name of patient
102	Given Name of patient
103	Gender of patient

key definition (cont'd.)

104	Birth Date of patient
107	Height of patient
108	Weight of patient
200	Admit Date/Time of patient
201	PID of patient visit
202	Room of patient visit
203	Bed of patient visit
204	Diagnosis of patient visit
205	Visit ID of patient visit
300	Order Date of patient order
301	PID of patient order
302	Type of patient order
303	Test Reason of patient order

Path Attribute

The **Path** attribute determines how to get the data item from HL7 messages. It has different values for various HL7 messages.

Explanation Attribute

The **Explanation** attribute contains a description of the mapped parts and can be empty.

A Sample of the Configuration File

A sample of the configuration file is indicated as follows:

The ADT_A01 message will be used as an example. ADT_A01 has a corresponding interface, and has two parameters, **Patient** and **Visit**, each is a **Group** item. Each group indicates what data is needed (the **key** attribute) and where to get it (the **path** attribute).

For the date time type mapping element, a format attribute is needed because different systems may employ different date time formats.

The **explanation** attribute exists only for the user's convenience.

```
<?xml version="1.0" encoding="utf-8" ?>
<HL7Mapping site="gumei" id="1075" ecgkeyword="ecg" stresskeyword="stress"
holterkeyword="holter">
  <Message type="ADT_A01" version="2.3">
    <Group name="Patient">
```

```

<mapping key="100" path=".PID(0)-2" explanation="patient id" />
<mapping key="101" path=".PID(0)-5-1" explanation="family name" />
<mapping key="102" path=".PID(0)-5-2" explanation="given name" />
<mapping key="103" path=".PID(0)-8" explanation="gender" />
<mapping key="104" path=".PID(0)-7" explanation="birthday" format="YYYY-MM-DD"
/>

</Group>
<Group name="Visit">
<mapping key="100" path=".PID(0)-2" explanation="patient id" />
<mapping key="101" path=".PID(0)-5-1" explanation="family name" />
<mapping key="102" path=".PID(0)-5-2" explanation="given name" />
<mapping key="103" path=".PID(0)-8" explanation="gender" />
<mapping key="104" path=".PID(0)-7" explanation="birthday" format="YYYY-MM-DD"
/>
</Group>
</Message>
</HL7Mapping>

```

ADT Message Handler Configuration

A01/A08

A01/A08 has two groups that need to be configured: **patient** and **visit**.

See the following example:

```

<Message type ="ADT_A01" version ="2.3">
  <HL7Mapping site="gumei" id="1075" ecgkeyword="ecg" stresskeyword="stress"
holterkeyword="holter">
    <Group name ="Patient">
      <mapping key="100" path=".PID(0)-2" explanation="patient id" />
      <mapping key="101" path=".PID(0)-5-1" explanation="family name" />
      <mapping key="102" path=".PID(0)-5-2" explanation="given name" />
      <mapping key="103" path=".PID(0)-8" explanation="gender" />
      <mapping key="104" path=".PID(0)-7" explanation="birthday" format="YYYY-MM-DD"
/>
    </Group>
    <Group name="Visit">

```

```

<mapping key="100" path=".PID(0)-2" explanation="patient id" />
<mapping key="101" path=".PID(0)-5-1" explanation="family name" />
<mapping key="102" path=".PID(0)-5-2" explanation="given name" />
<mapping key="103" path=".PID(0)-8" explanation="gender" />
<mapping key="104" path=".PID(0)-7" explanation="birthday" format="YYYY-MM-DD"
/>

</Group>
</Message>

```

A39/A40

A39/A40 has two groups that need to be configured, ***new patient*** and ***old patient***.

See the following example:

```

<Message type="ADT_A39" version="2.3">
  <Groups>
    <Group name="OldPatientID">
      <Mappings>
        <Mapping key ="100" path=".MRG(0)-4" rep ="false" explanation="Old patient ID" />
      </Mappings>
    </Group>
    <Group name="NewPatientID">
      <Mappings>
        <Mapping key ="100" path=".PID(0)-2" rep ="false" explanation="New patient ID" />
      </Mappings>
    </Group>
  </Groups>
</Message>

```

ORM Message Handler Configuration

The ORM message handler has two groups that need to be configured: ***order*** and ***visit***.

See the following example:

```

<Message type="ORM_001" version="2.3">
  <Groups>
    <Group name="Order">
      <Mappings>

```

```

<Mapping key="300" path=".ORC(0)-9" rep ="false" explanation="order date" />
<Mapping key="301" path=".PID(0)-3" rep ="false" explanation="patient id" />
<Mapping key="302" path=".OBR(0)-4-2" rep ="false" explanation="device type" />
<Mapping key="303" path=".OBR(0)-31-2" rep ="false" explanation="test reason" />
</Mappings>
</Group>
<Group name="Visit">
<Mappings>
<Mapping key="200" path=".MSH(0)-7" rep ="false" explanation="visit date time" />
<Mapping key="201" path=".PID(0)-3-1" rep ="false" explanation="patient id" />
<Mapping key="202" path=".PV1(0)-11-2" rep ="false" explanation="room" />
<Mapping key="203" path=".PV1(0)-11-3" rep ="false" explanation="bed" />
<Mapping key="204" path=".DG1(0)-4" rep ="false" explanation="diagnosis"/>
<Mapping key="205" path=".PV1(0)-19-1" rep ="false" explanation="visit id"/>
</Mappings>
</Group>
</Groups>
</Message>

```

OMG Message Handler Configuration

OMG message handler has one group to configure, ***order***.

See the following example:

```

<Message type="OMG_O19" version="2.3">
<Groups>
<Group name="Order">
<Mappings>
<Mapping key="300" path=".ORC(0)-9" rep ="false" explanation="order date" />
<Mapping key="301" path=".PID(0)-3" rep ="false" explanation="patient id" />
<Mapping key="302" path=".OBR(0)-4-2" rep ="false" explanation="device type" />
<Mapping key="303" path=".OBR(0)-31-2" rep ="false" explanation="test reason" />
</Mappings>
</Group>
</Groups>
</Message>

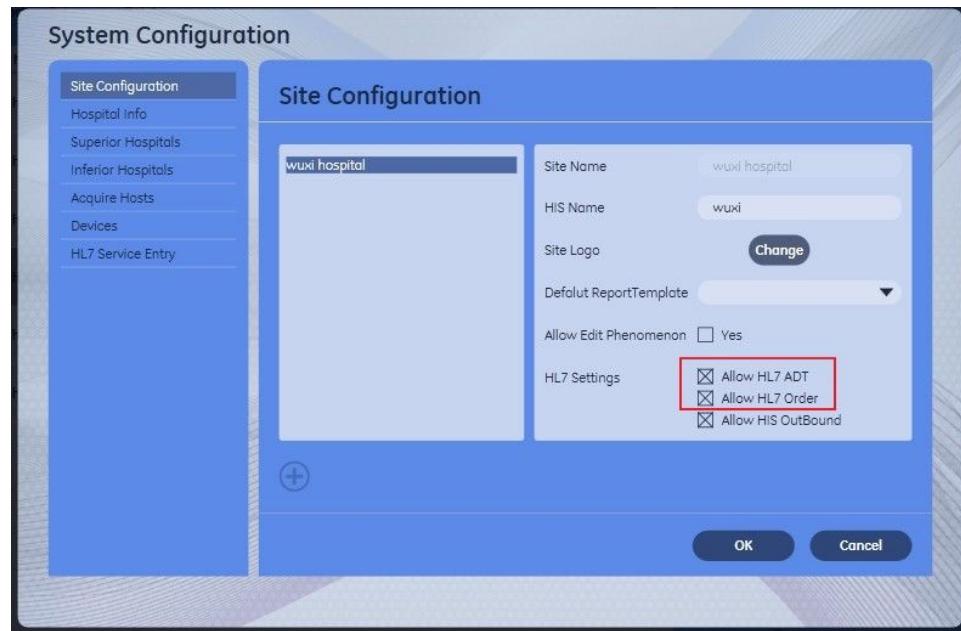
```

Enabling the system HL7 Inbound

Open the **Site Configuration** window by clicking **System Configuration > Site Configuration**.

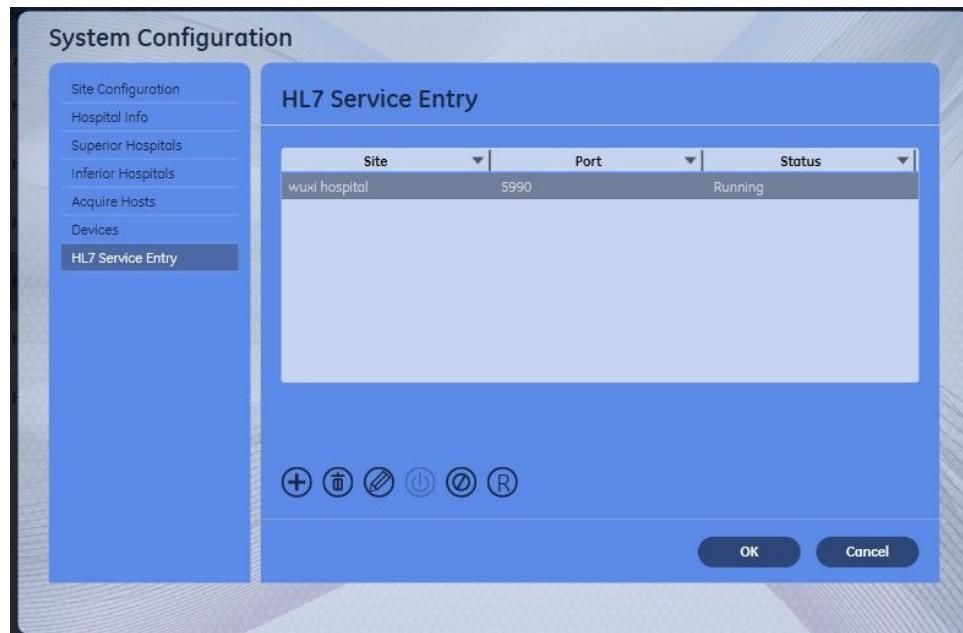
HL7 Settings are enabled by selecting the following check boxes:

- **Allow HL7 ADT**
- **Allow HL7 Order**



Configuring the System HL7 Service Entry

1. Open the **HL7 Service Entry** window by clicking **System Configuration > HL7 Service Entry**.



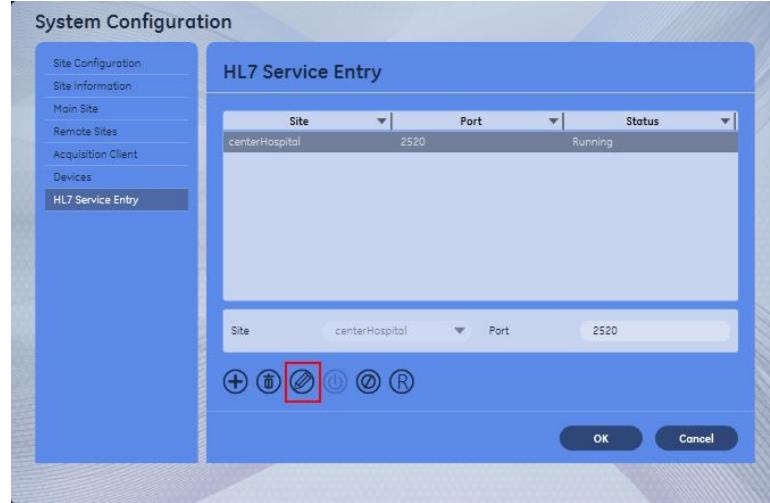
- Each site should use an HL7 service entry so that it is mapped.
 - Make sure the port has not been occupied by other program and software. The port is different between each site.
2. In the **HL7 Service Entry** window, click **Start** to start the service entry.



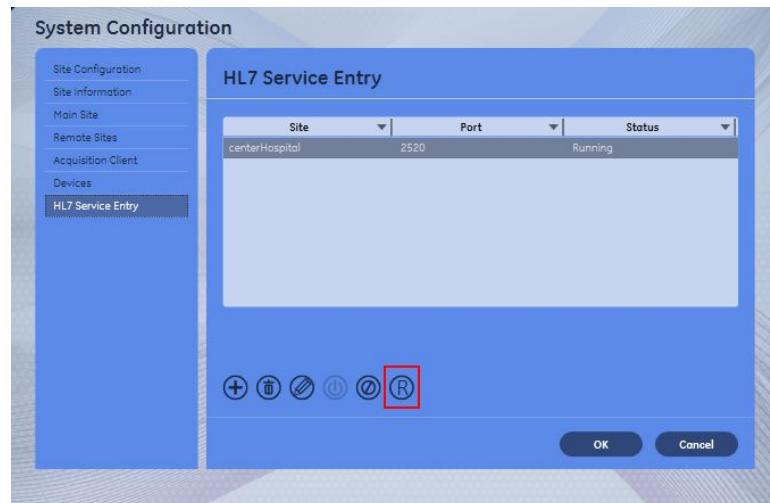
NOTE:

Make sure the status of the service entry is **Running**.

- You can change the configuration of the service entry by clicking **Modify** (Port, remove service entry, and so on).



- If any change has been made to the service entry configuration, you need to restart the service entry by clicking **Restart**.



After the above configurations have been set, the system will accept HL7 ADT and Order messages from the HIS. You need to restart the system service to apply these changes.

3

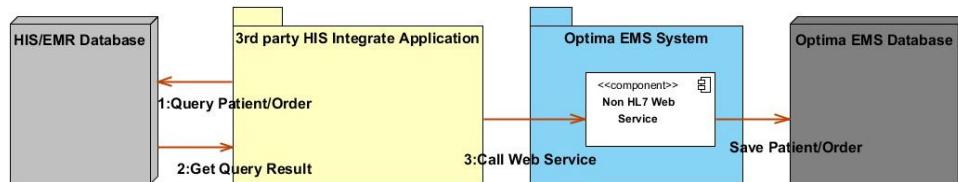
Non-HL7 Inbound

The system supports non-HL7 interfaces to import patient and order data from the HIS. It provides a web service to import patients and orders for third-party applications. The default service address is <http://Optima EMS Server IP address:8999/MacItWebServiceInBound>.

The following web service functions are provided by the system non-HL7 Interface.

Function Name	Function Prototype
<i>IsPatientExisted</i>	IsPatientExisted (string patientID, string hisID)
<i>AdmitPatient</i>	AdmitPatient (Patient patient, PatientVisit visit, string HisID)
<i>UpdatePatient</i>	UpdatePatient (Patient patient, PatientVisit visit, string HisID)
<i>MergePatient</i>	MergePatient (string oldPatientIDList, string newPatientID, string HisID)
<i>CreateOrder</i>	CreateOrder (Order order, string HisID)

See the following data flow diagram.



IsPatientExisted

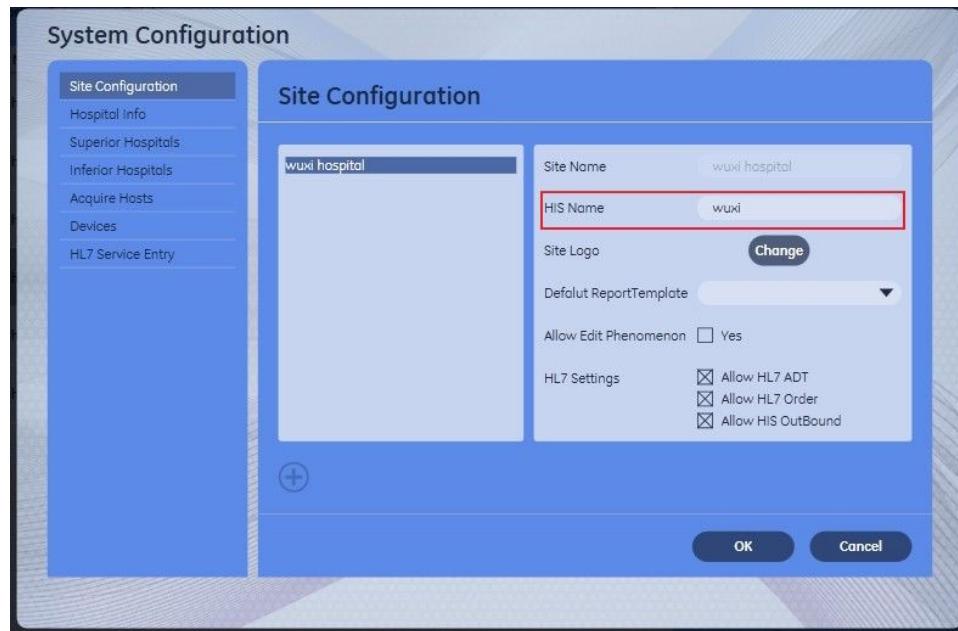
This function is used to check whether a patient already exists in the system.

IsPatientExisted has two parameters.

- *PatientID*: the patient identify ID in HIS system
- *HisID*: identifies which site the patient belongs to

The HISID should be same as in the system and cannot be empty. Obtain the value by performing the following procedure:

1. Log into the Optimal EMS system.
2. Open the **Site Configuration** window by clicking **System Configuration > Site Configuration**.
3. At the **Site Configuration** window, set the **HISID** value shown in the left window to the same value as the **HIS Name**.



AdmitPatient

This function is used to create a new patient in the system. It has three parameters.

AdmitPatient has follow sub-data items.

Name	Enable empty value	Description
SocialInsuranceNum	No	Patient social security number. If the patient does not have a social security number, keep this field blank.
SocialInsuranceType	No	Patient social security type. Different areas of China may have different types of social security. If a social security type is not present, keep this field blank.
PatientID	No	Patient ID in the HIS system.
FamilyName	No	Family name of the Patient
GivenName	No	Given name of the Patient

<i>BirthDate</i>	Yes	Date of birth of the Patient
<i>Gender</i>	No	Gender of patient. The value can be one of following: Male, Female, Unknown.
<i>Age</i>	Yes	Age of the Patient
<i>AgeUnit</i>	No	Patient age field. The value can be one of following: Year, Month, Week, Day, Hour, Unknown.
<i>HeightInCm</i>	Yes	Height of the Patient
<i>WeightInKg</i>	Yes	Weight of the Patient

PatientVisit: patient visit information from the HIS has the following sub-data items:

Name	Enable empty value	Description
<i>HisVisitID</i>	No	Patient visit ID in the HIS. It is used to identify multiple patient visits.
<i>PatientID</i>	No	Patient ID in the HIS system.
<i>Room</i>	Yes	Room number of the Patient
<i>Bed</i>	Yes	Bed number of the Patient
<i>Diagnosis</i>	Yes	Diagnosis result of the Patient
<i>AdmitDatetime</i>	No	Patient visit time.

HisID: same as the HisID parameter of “[IsPatientExisted](#)” on page 23.

UpdatePatient

This function is used to update patient information and create a new patient visit information in the system.

UpdatePatient has three parameters.

- **Patient:** has the same patient parameters as the **AdmitPatient** function.
- **PatientVisit:** has the same patient visit parameters as the **AdmitPatient** function
- **HisID:** same as the patient visit parameters of “[IsPatientExisted](#)” on page 23.

MergePatient

This function is used to merge multiple patients into one patient in the system.

MergePatient has three parameters.

- **oldPatientIDList**: the patient ID in the HIS system which will be merged in the system.
- **newPatientID**: the patient ID in the HIS system which will replace other patients in the system.
- **HisID**: same as the HisID parameters of “[IsPatientExisted](#)” on page 23.

CreateOrder

This function is used to create patient order information in the system.

CreateOrder has two parameters.

Order: patient order information from the HIS with the following sub-data items:

Name	Enable empty value	Note
PatientID	No	Patient ID in the HIS system.
HisOrderID	No	Patient order ID in the HIS system.
HisVisitID	No	Patient visit ID in the HIS system.
OrderDate	No	Patient order date in the HIS system.
TestReason	Yes	Reason for the patient test
DeviceType	No	Type of patient order. The value can be one of following: ECG , Stress , Holter , and Unknown .

HisID: same as the HisID parameters of “[IsPatientExisted](#)” on page 23.

4

HIS/EMR Outbound

The system supports exporting of billing and diagnosis result report information to a shared folder. A HIS or EMR system should access this shared folder to get outbound data (billing, diagnosis result report). There are no real-time HL7 outbound messages which communicate between the system and HIS/EMR. The appropriate HIS option (HIS output) should be enabled in the system, to automatically export billing and test reports of a confirmed test. HIS/EMR could access the shared folder on the system server over the network.

Activating the System HIS/EMR Outbound

Enabling the System HIS Outbound

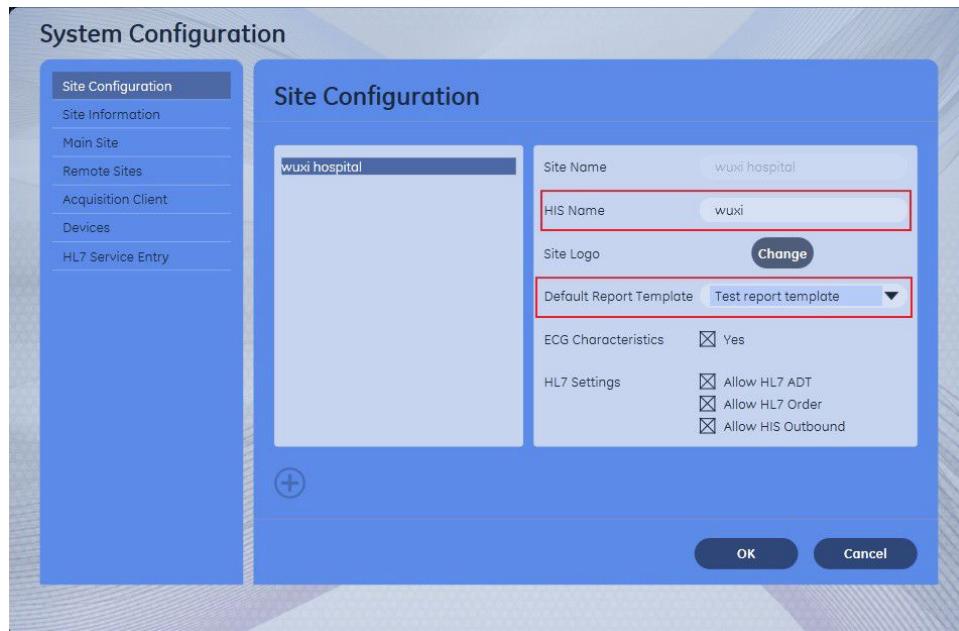
1. Open the **Site Configuration** window by clicking **System Configuration > Site Configuration**.
2. Select the **Allow HL7 Outbound** check box.

The HIS outbound is now enabled.

Configuring the System HIS Outbound Configurations

1. At the **HIS Name** field, type the HIS name, which is the same name as the folder name where all test report are exported to for that particular site. This field should not be left empty.
2. Select the **Default Report Template** by choosing from the list in the drop-down menu.

In the following figure, the **Test report template** was selected.



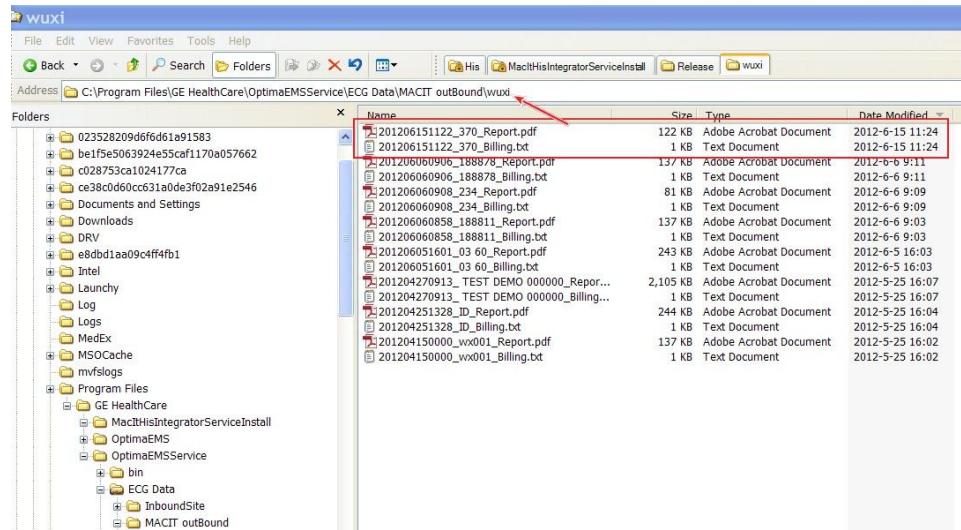
Configuring the System HIS Outbound Shared Folder

This shared folder is on the system server. The default path is: **C:\Program Files\GE HealthCare\OptimaEMSService\ECG Data\MACIT outbound\ + HisName.**

- Set the permissions of the following folder so that it can be accessed by the HIS/EMR system:

C:\Program Files\GE HealthCare\OptimaEMSService\ECG Data\MACIT outbound\ + HisName.

The system will now automatically export billing and test reports to a shared folder when a user confirms a test.



NOTE:

The system will export billing of an order as a file with the .txt extension. The content is a HL7 DFT_P03 message.

The system will export diagnosis result report of an order as a file with a .pdf extension.

The export file name rule is **patientOrderDatetime_PID_Report.pdf** and **patientOrderDatetime_PID_Billing.txt**

The system supports customized HIS/EMR outbound file name rules when needed.

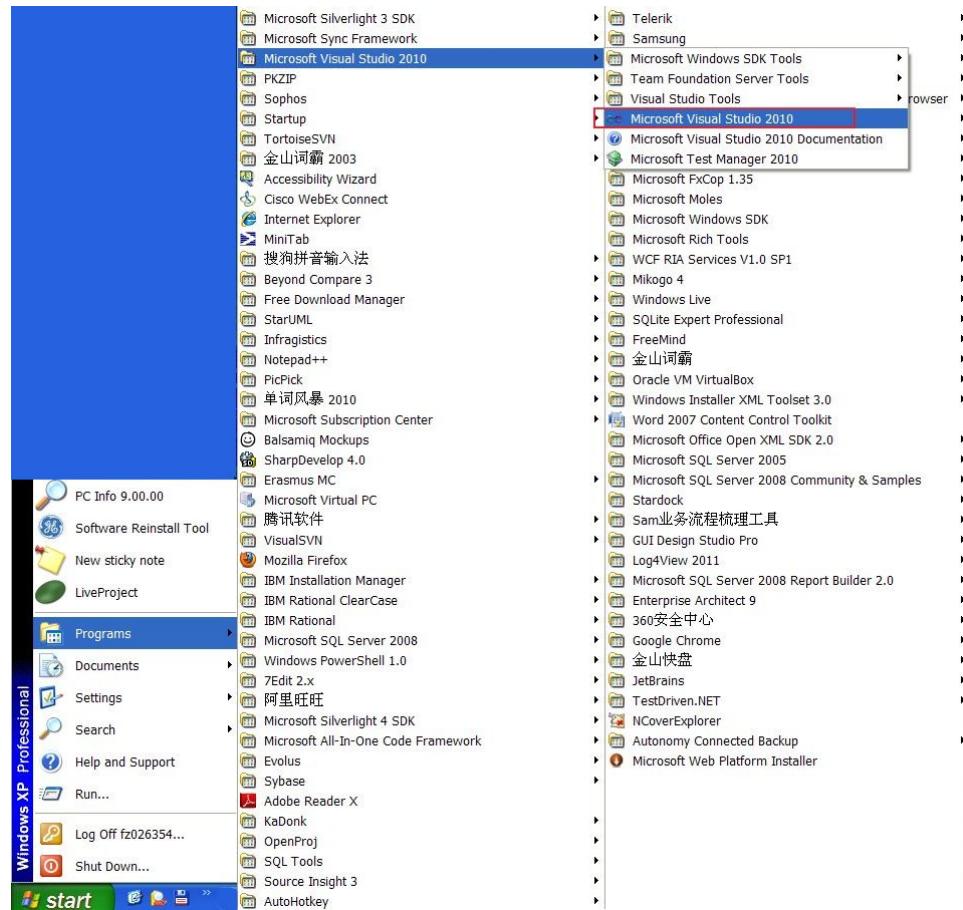
Customizing HIS/EMR Outbound File Name Rules

Creating A C# Class Library Project

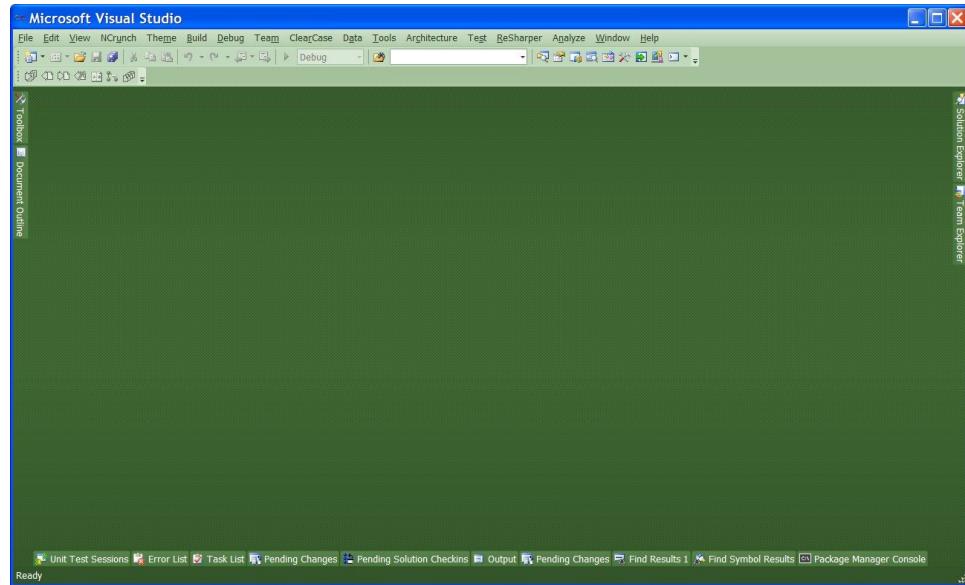
- From your desktop, click **Start > Programs > Microsoft Visual Studio 2010 > Microsoft Visual Studio 2010**.

NOTE:

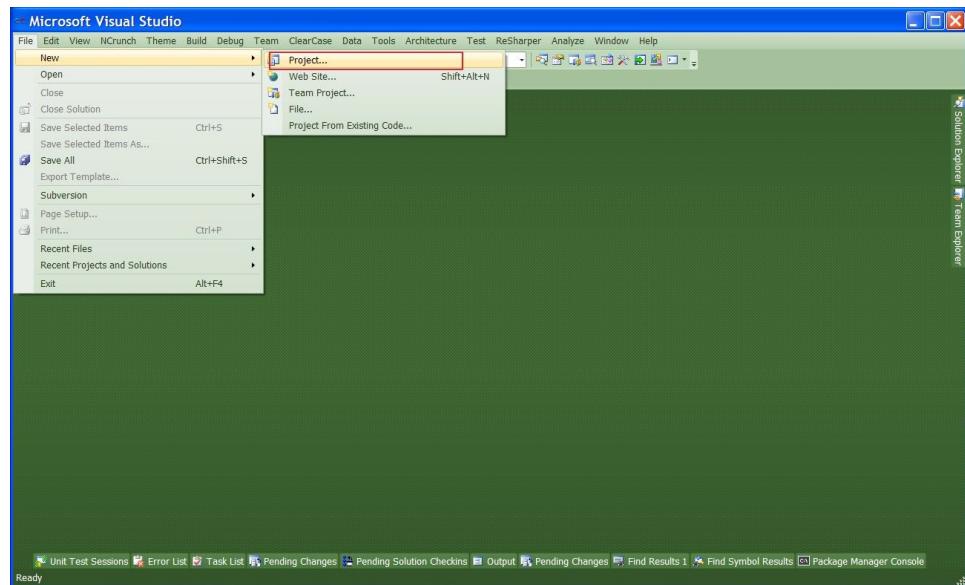
The **Microsoft Visual Studio 2010** is a software development tool which needs to be installed on your local machine.



The *Microsoft Visual Studio* window opens.

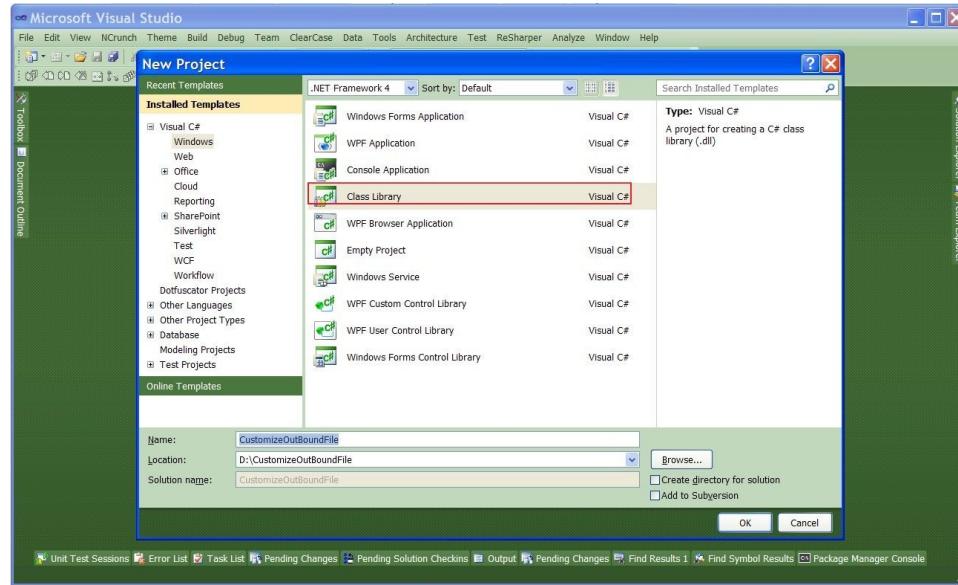


2. Click *File > New > Project....*



The *New Project* window opens.

3. Click the **Class Library** in the **New Project** window.

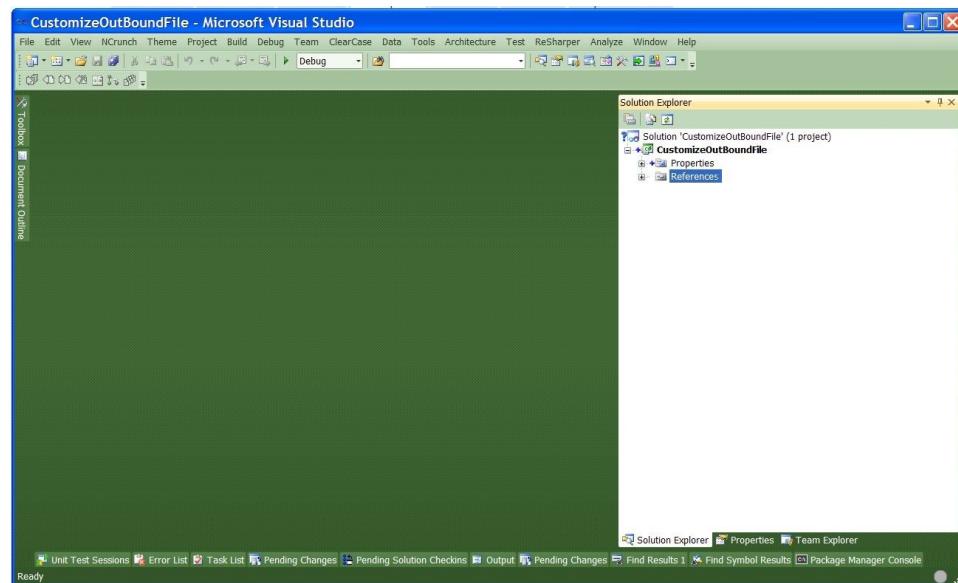


4. Enter the information displayed at the bottom of the **New Project** window.

- **Name:** the project name
For example, **CustomizeOutBoundFile**.
- **Location:** the project location
It is a local storage file folder path which save this project content.
For example, **D:\CustomizeOutBoundFile folder**.

5. Click **OK**.

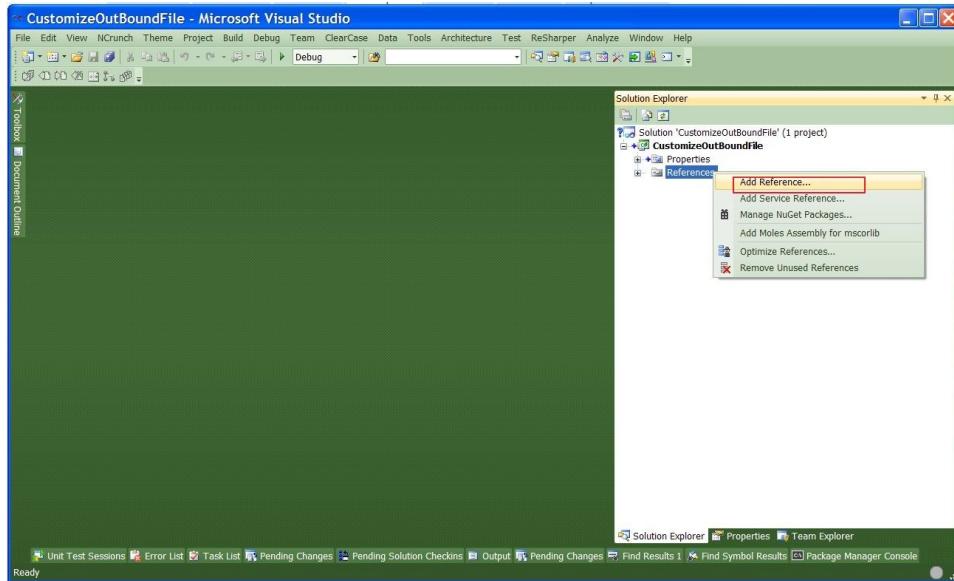
A new project is created successfully and will be opened automatically (**CustomizeOutBoundFile** window as example).



Adding MacItHooks.dll Reference

A reference needs to be added to the **MacItHooks.dll** file in a new project.

- Right-click the **Reference** in the **Solution Explorer** panel of the **CustomizeOutBoundFile** window.

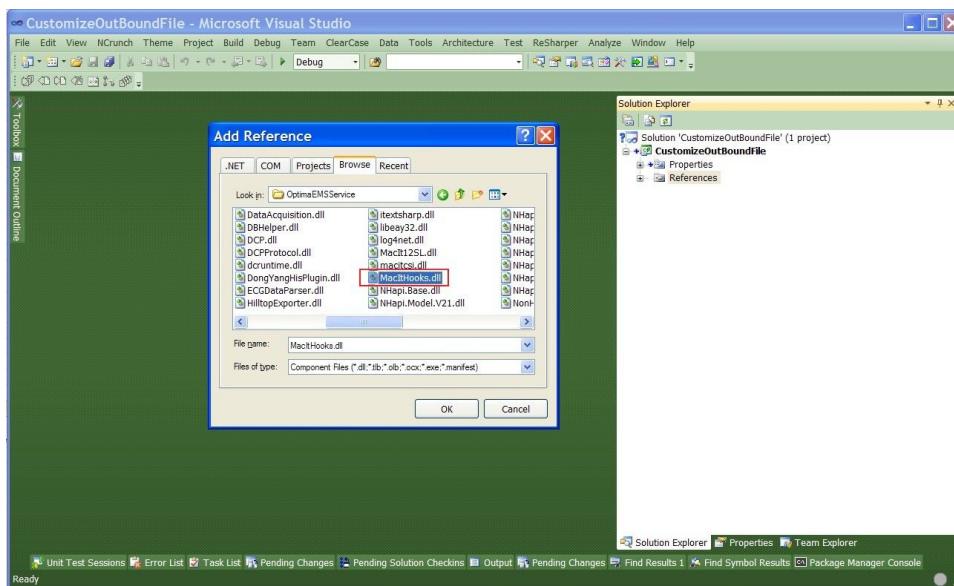


The **Add Reference** window opens.

- Click **Browse** to choose the **MacItHooks.dll** from the local file.

NOTE:

The **MacItHooks.dll** is located at the system server installation folder by default: **C:\Program Files\GE HealthCare\OptimaEMSService**.

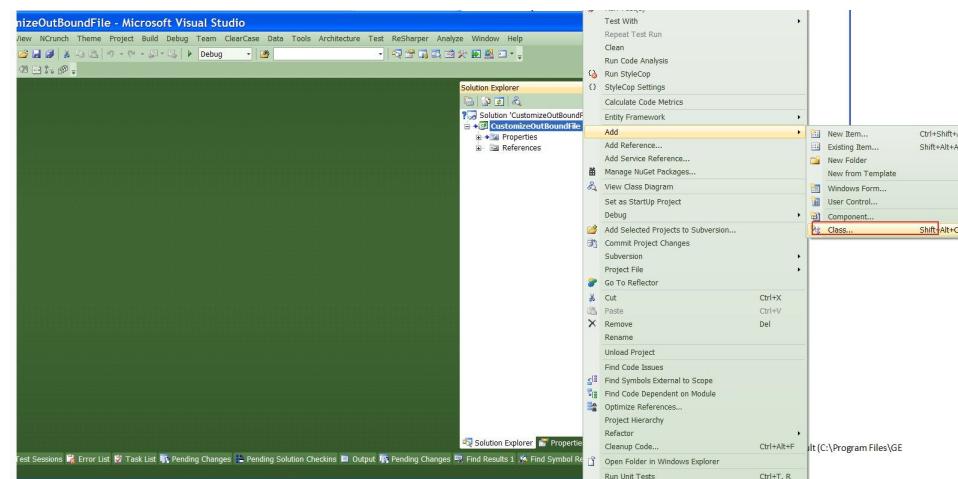


- Click **OK**.

The reference is added to the **MacItHooks.dll** file successfully.

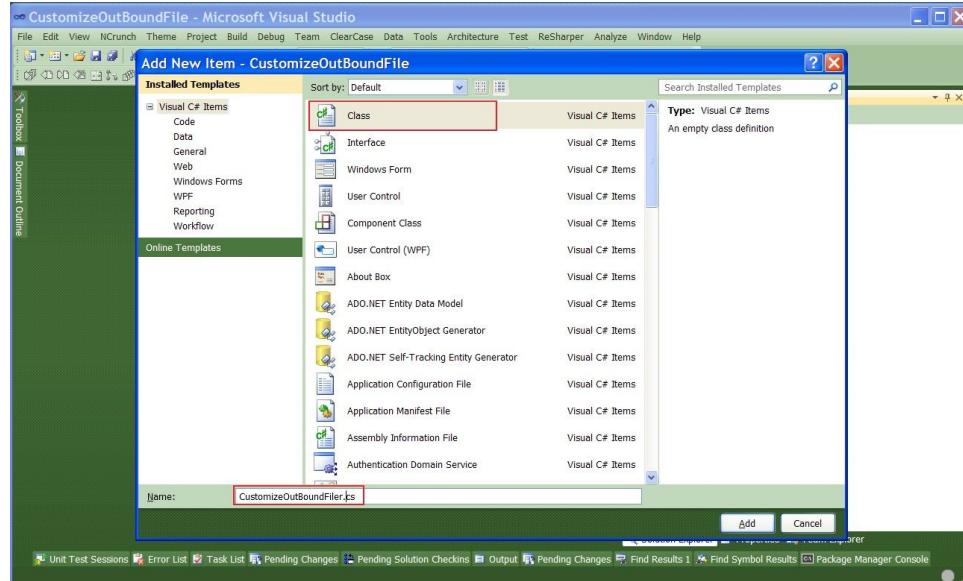
Adding A New Class Named *CustomizeOutBoundFiler*

1. Right-click the *CustomizeOutBoundFile* in the *Solution Explorer* panel of the *CustomizeOutBoundFile* window.
2. Select *Add > Class....*



The *Add New Item* window opens.

3. Select **Class** in the **Add New Item** window, and enter the **Name** displayed at the bottom of the **Add New Item** window.



4. Click **Add**.
the **Source Code Edit** window will open automatically.

```

1 //using System;
2 //using System.Collections.Generic;
3 //using System.Linq;
4 //using System.Text;
5
6 namespace CustomizeOutBoundFile
7 {
8     public class CustomizeOutBoundFile : GEHC.MAIC.Hooks.IHisOutboundFileNameStrategy
9     {
10        /// <summary>
11        /// Gets the name of his outbound file.
12        /// </summary>
13        /// <param name="siteId">The site id.</param>
14        /// <param name="orderId">The order id.</param>
15        /// <param name="testId">The test id.</param>
16        /// <param name="patientId">The patient id.</param>
17        /// <param name="hisOrderId">His order id.</param>
18        /// <param name="testDate">The test date.</param>
19        /// <returns></returns>
20        public string GetHisOutboundFileName(int siteId, int orderId, int testId, string patientId, string hisOrderId, DateTime testDate)
21        {
22            // add out bound file name code here
23            return string.Empty;
24        }
25    }
26}

```

Implementing IHisOutboundFileNameStrategy Interface in CustomizeOutBoundFiler Class

In the **Source Code Edit** window, you can write your source code to implement the customize function.

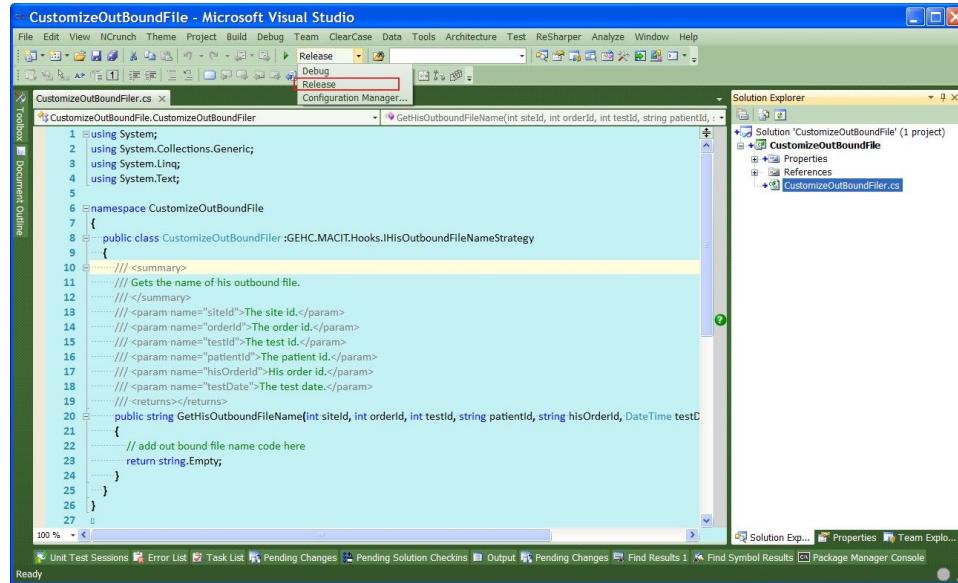
1. Mark class *CustomizeOutBoundFiler* as the public prefix.
 2. Inherit the *IHisOutboundFileNameStrategy* interface.
 3. Implement the *GetHisOutboundFileName* function code customized.

The screenshot shows the Microsoft Visual Studio interface with the title bar "CustomizeOutBoundFile - Microsoft Visual Studio". The menu bar includes File, Edit, View, NCrunch, Theme, Project, Build, Debug, Team, ClearCase, Data, Tools, Architecture, Test, ReSharper, Analyze, Window, Help. The toolbar has icons for file operations like Open, Save, Print, and a search bar. The Solution Explorer on the right shows a single solution named "CustomizeOutBoundFile" with one project and one file: "CustomizeOutBoundFile.cs". The code editor window displays the following C# code:

```
1 using System;
2 using System.Collections.Generic;
3 using System.Linq;
4 using System.Text;
5
6 namespace CustomizeOutBoundFile
7 {
8     public class CustomizeOutBoundFile : GEHC.MACIT.Hooks.IHisOutboundFileNameStrategy
9     {
10         ///<summary>
11         /// Gets the name of his outbound file.
12         ///</summary>
13         ///<param name="siteId">The site id.</param>
14         ///<param name="orderId">The order id.</param>
15         ///<param name="testId">The test id.</param>
16         ///<param name="patientId">The patient id.</param>
17         ///<param name="hisOrderId">His order id.</param>
18         ///<param name="testDate">The test date.</param>
19         ///<returns></returns>
20         public string GetHisOutboundFileName(int siteId, int orderId, int testId, string patientId, string hisOrderId, DateTime testDate)
21         {
22             // add out bound file name code here
23             return string.Empty;
24         }
25     }
26 }
27
```

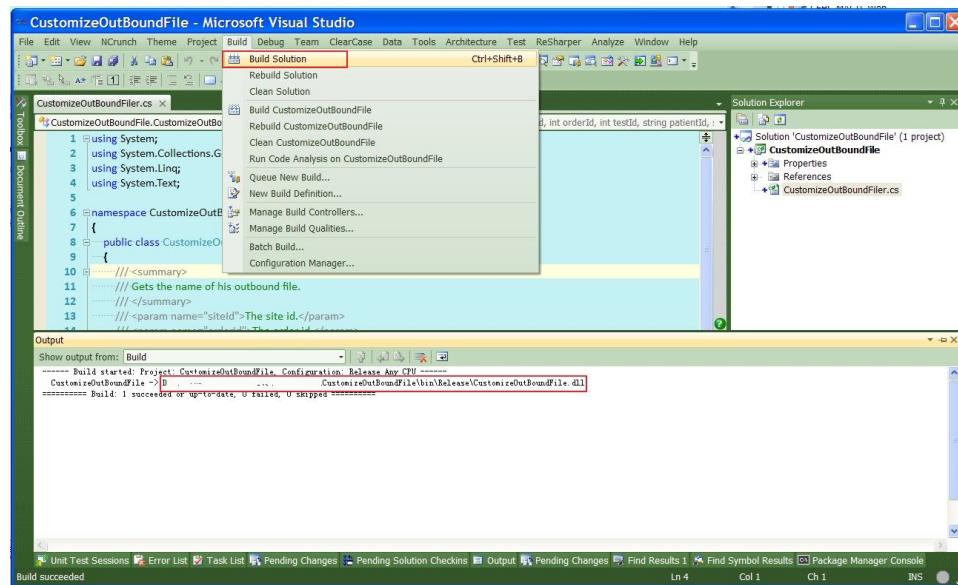
Building C# dll Library Project

- Select **Release** in the **Build Option** field.



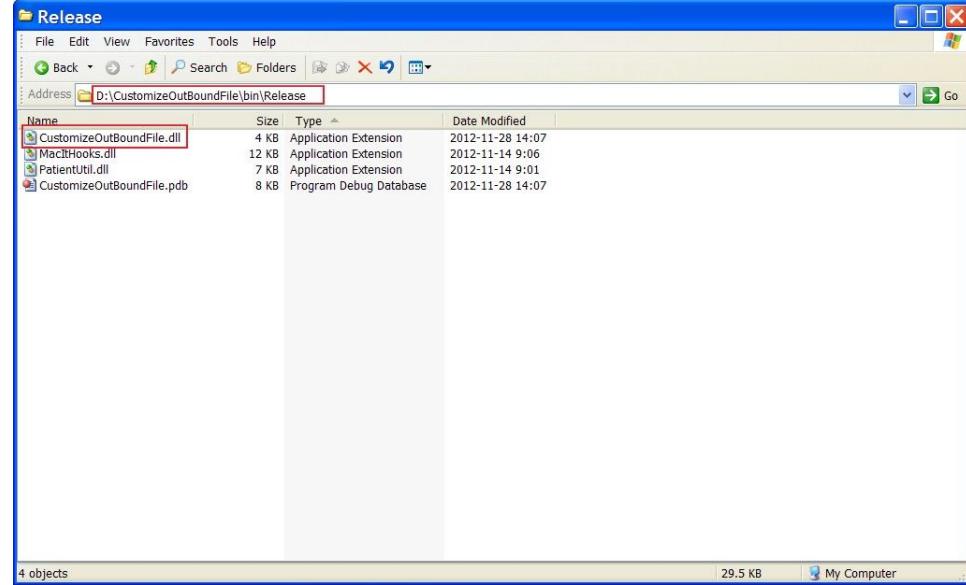
- Build the project by clicking **Build > Build Solution**.

This will generate the **Build Log** in the **Output** window.



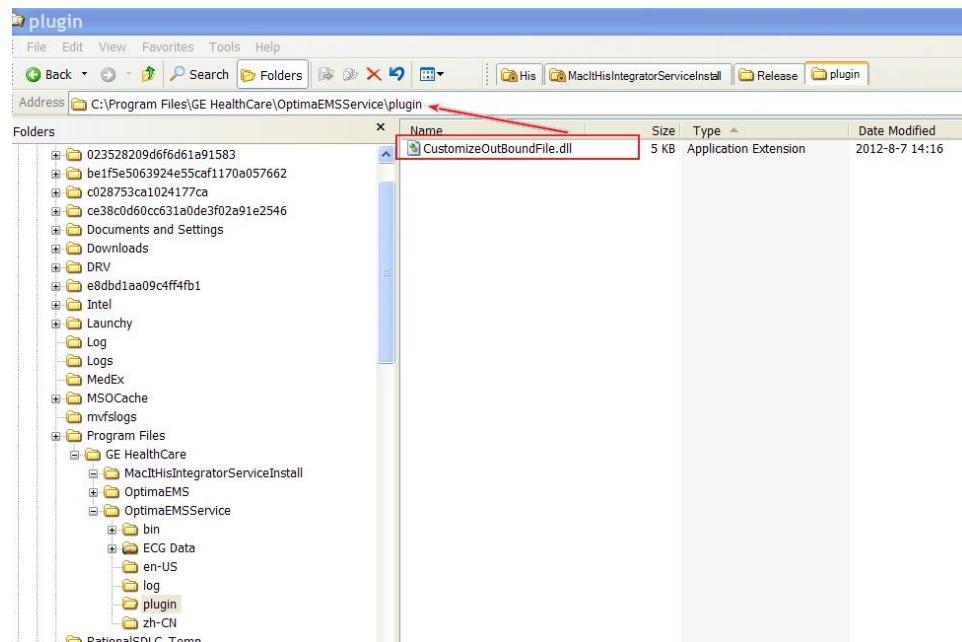
- Get the **Project Build Result** file.

The **Project Build Result** file is located in **bin\Release** folder under the project location you created in Step 4 of "[Creating A C# Class Library Project](#)" on page [30](#). And the file name is **CustomizeOutBoundFile.dll**.



Releasing Assembly dll File to the System Server

Copy the **Project Build Result** file you got in Step 3 of “Building C# dll Library Project” on page 37 to the Plugin folder under the system server installation folder.





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