

Optima EMS ECG Management System XML Import Guideline for Third-Party Device

Software Version 1.0
2069773-003 Revision C



Publication Information

The information in this manual applies only to Optima EMS ECG Management System Version 1.0. It does not apply to earlier product versions. Due to continuing product innovation, specifications in this manual are subject to change without notice.

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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
A	1 November 2012	Internal Release
B	10 December 2012	Initial release for customer
C	17 July 2013	Per SPR HCSDM00221960 a new section titled: <i>Setting Up the Connection with NK1550P</i> was added.

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Service Manual Language Information

WARNING (EN)	<p>This service manual is available in English only.</p> <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)	<p>Това упътване за работа е налично само на английски език.</p> <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	<p>本维修手册仅提供英文版本。</p> <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)	<p>本維修手冊只提供英文版。</p> <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 tekniker, 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 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)	<p>Tämä huolto-ohje on saatavilla vain englanniksi.</p> <ul style="list-style-type: none"> • 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.

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 Zuwiderhandlung 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 kizárólag 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 elkészítése. • Ne próbálja elkezdni 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.
ADVÖRUN (IS)	<p>Þessi þjónustuhandbók er eingöngu fáanleg á ensku.</p> <ul style="list-style-type: none"> • Ef að þjónustuveitandi viðskiptamanns þarfnast annars tungumáls en ensku, er það skylda viðskiptamanns að skaffa tungumálþjónustu. • Reyndi ekki að afgreiða tækið nema þessi þjónustuhandbók hefur verið skoðuð og skilin. • Brot á að sinna þessari aðvörun getur leitt til meiðsla á þjónustuveitanda, stjórnanda 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 위험을 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.
ĮSPĖJIMAS (LT)	<p>Šis eksploataavimo vadovas yra prieinamas tik anglų kalba.</p> <ul style="list-style-type: none"> 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 eksploataavimo 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.)

<p>OSTRZEŻENIE (PL)</p>	<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.
<p>AVISO (PT-BR)</p>	<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.
<p>AVISO (PT-PT)</p>	<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.
<p>AVERTISMENT (RO)</p>	<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 înțelegerii acestui manual de service. • Ignorarea acestui avertisment ar putea duce la rănirea depănatorului, operatorului sau pacientului în urma pericolelor de electrocutare, mecanice sau de altă natură.
<p>ПРЕДУПРЕЖДЕНИЕ (RU)</p>	<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 приступать 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.
<p>UPOZORENJE (SR)</p>	<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 serviser, 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 zákazníkovi 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 vyústiť 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 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.
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 uyarıya uyulmaması, elektrik, mekanik veya diğer tehlikelerden dolayı teknisyen, operatör veya hastanın yaralanmasına yol açabilir.

Service Manual Language Information (cont'd.)

<p>ЗАСТЕРЕЖЕННЯ (UK)</p>	<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 намагайтеся здійснювати технічне обслуговування даного обладнання, якщо ви не читали, або не зрозуміли інформацію, надану в керівництві з сервісного обслуговування. • Недотримання цього застереження може призвести до травмування сервісного інженера, користувача даного обладнання або пацієнта внаслідок електричного шоку, механічного ушкодження або з інших причин невірної обслуговування обладнання.
<p>CẢNH BÁO (VI)</p>	<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.

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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 importing XML files from third-party device.

Manual Purpose

This manual provides a detailed description of the third-party ECG data solution of the Optima EMS system (also referred to as "the system" throughout this manual).

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 Text</i>	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 .
>	<p>The greater than symbol, or right angle bracket, is a concise method to indicate a sequence of menu selections.</p> <p>For example, the statement "From the main menu, select System > Setup > Options to open the Option Activation window" replaces the following:</p> <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.

Responsibility of the Purchaser/Customer

The customer is responsible for providing appropriate desks, chairs, electrical wall outlets, network connections, analog phone lines, and for locating any of the Optima EMS system components described in this manual in compliance with all local, state or national codes.

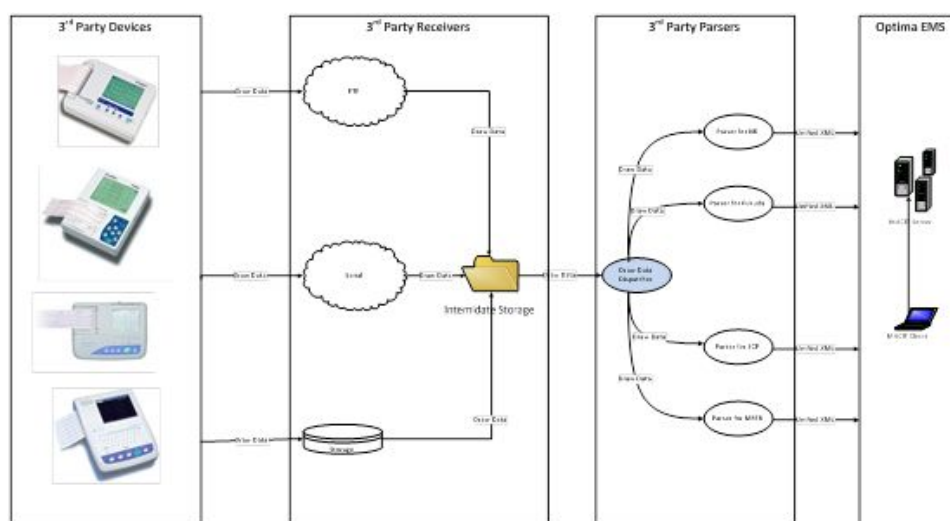
Additional Assistance

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.

Third-Party ECG Data Solution Overview

Third-party ECG data solution provides the capability to receive data from third-party devices (such as NK devices, Fukuda devices, and so on).



Solution Overview

As illustrated in the figure Solution Overview, there are two steps when sending third-party data to the system.

1. Receive data from third-party devices.
The most preferred transmission method is FTP and shared folder. These two methods need no extra proprietary software. Free software could handle the transmission equally well. Serial transmission, in most cases, needs software from device vendors.
2. Convert the received data to the system compatible format and send it to the system.
This step converts data to the system compatible format. The solution includes three parsers, one is dedicate for NK devices, one is dedicate for Fukuda devices, and the last is dedicated to the SCP open format. As will be illustrated in the document, other newly developed parsers could also easily be added to this solution.

3

Third-Party ECG Data Solution User Guidelines

Third-party ECG data solution provides the capability to receive data from third-party devices (such as NK devices, Fukuda devices, and so on).

Setting Up the Connection with NK1550P

Before Installation

ECG Viewer II is required when connecting to NK1550P.

NOTE:

ECG Viewer II is compatible with Windows 2000 and Windows XP. If you are using Windows 7, compatible mode is needed during installing.

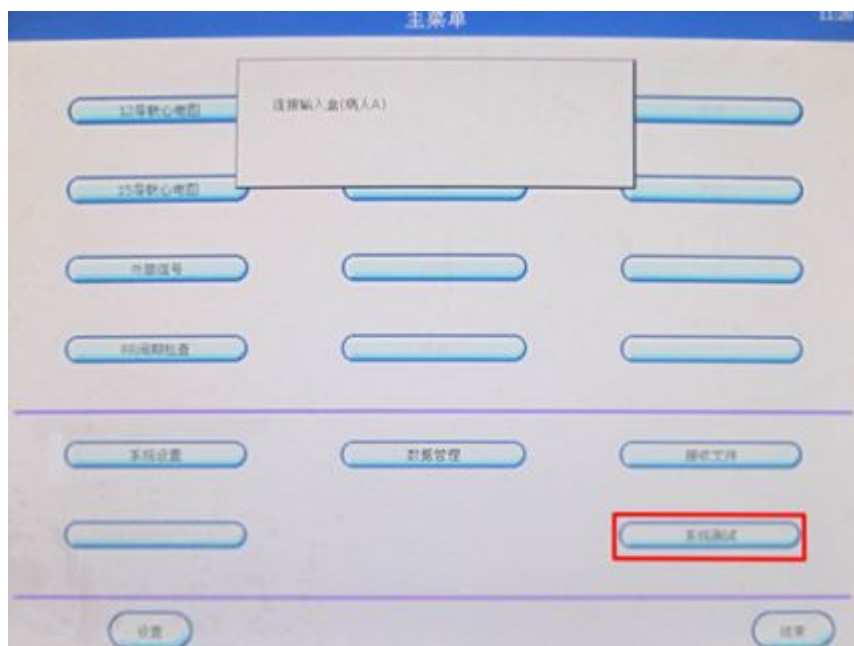


NK1550P Network Setup

1. From the main window, click **Menu**.



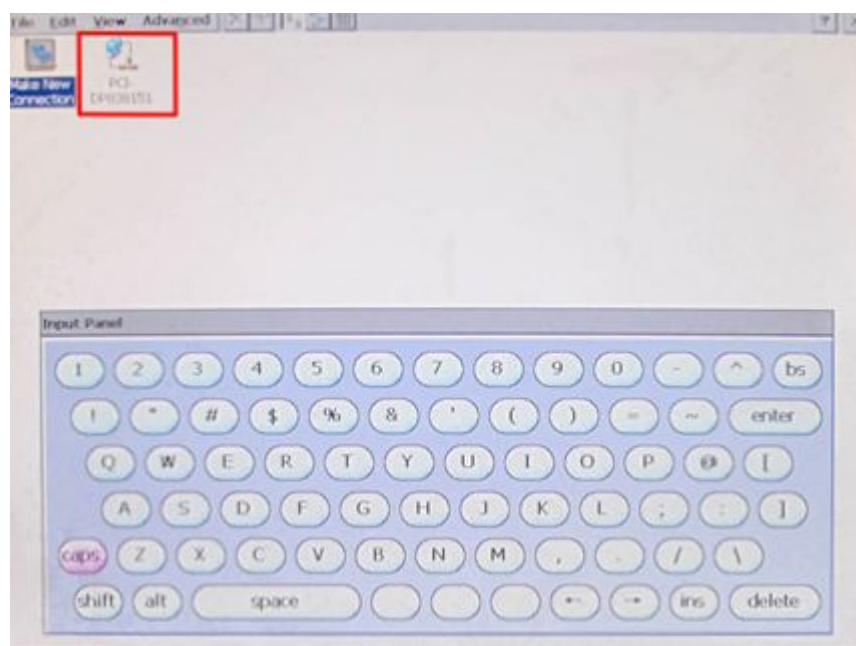
2. Click **System Testing**.



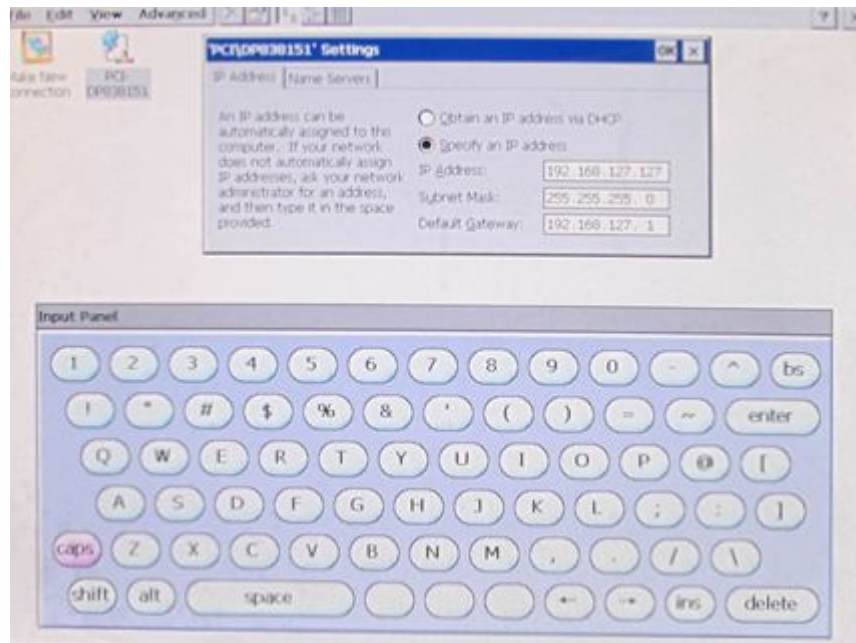
3. Click **Network Setup**.



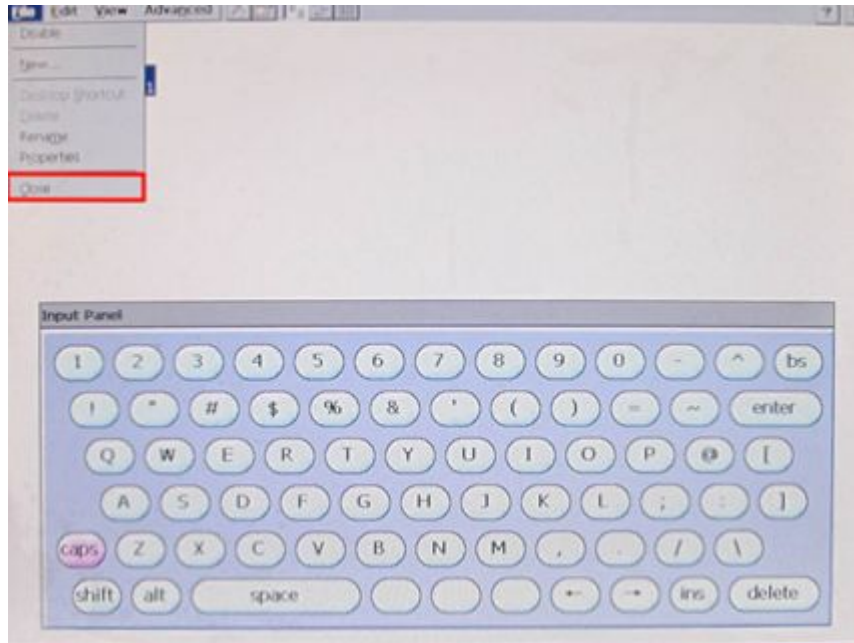
4. Double-click the network adapter.



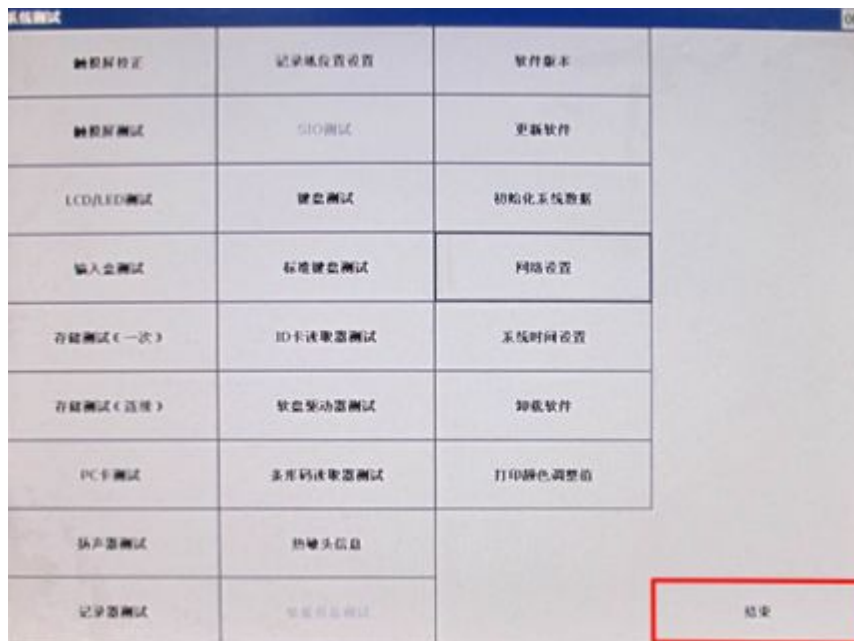
5. Setup the **IP Address**, **Subnet Mask**, and **Default Gateway** according to the network environment.



6. Exit the **Network Setup** by selecting **File > Close**.



7. Close the **System Testing** by clicking **End** in the **System Testing** window.

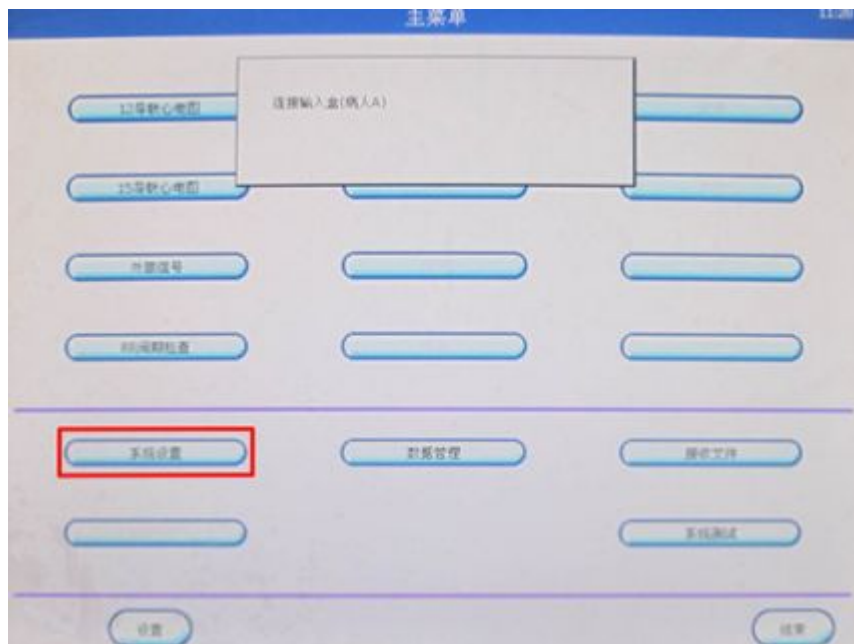


Communication Setup

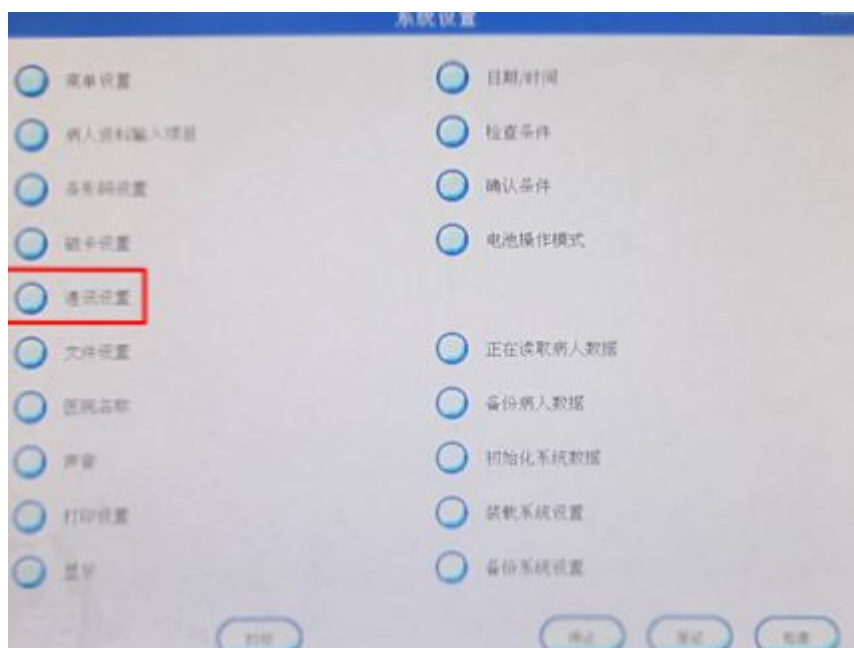
1. From the main window, click **Menu**.



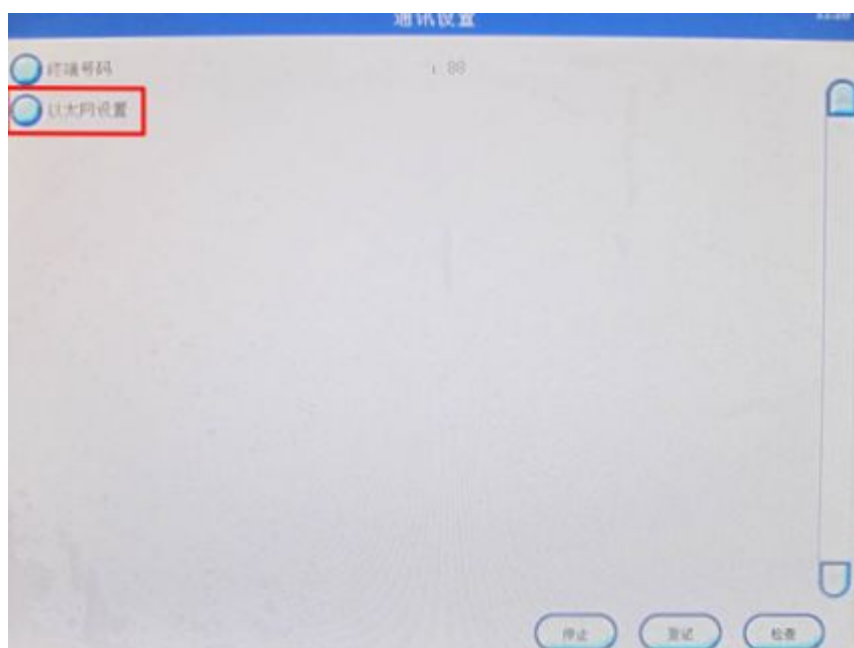
2. Click **System Setup**.



3. Click **Communication Setup**.



4. Click **Ethernet Setup**.

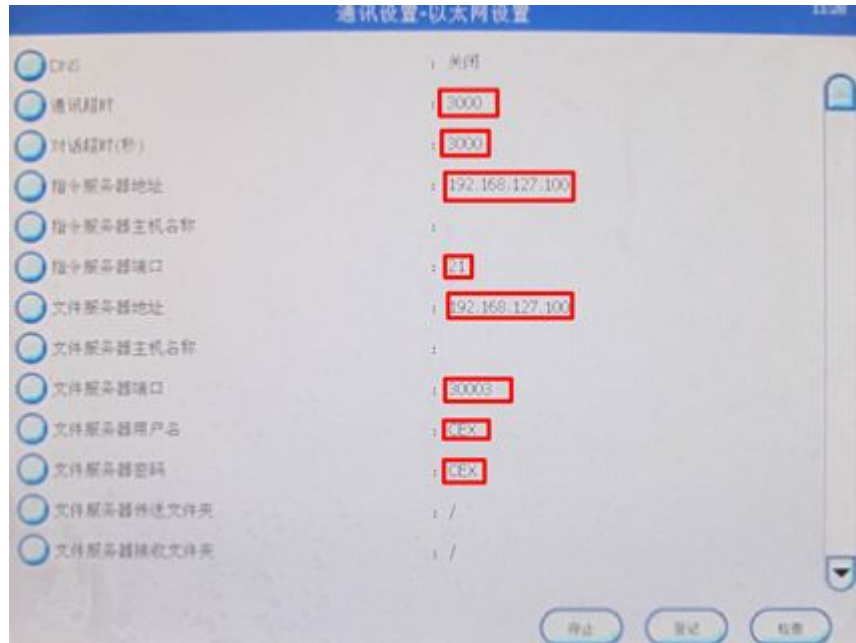


5. Setup the Ethernet according to the following illustrations.

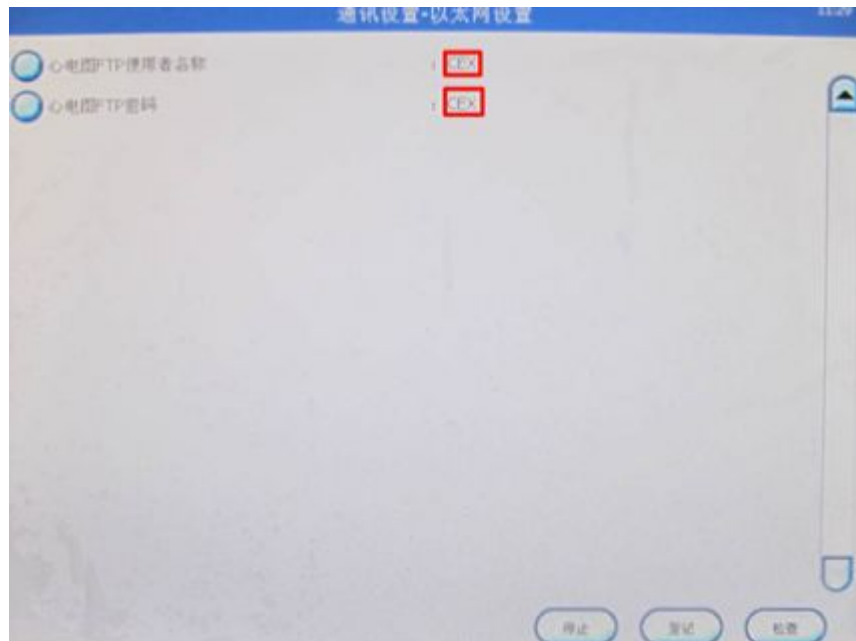
NOTE:

Enter the **Directive Server Address** and **File Server Address** with the IP address of the computer where **ECG Viewer II** is installed.

- a. Enter the highlighted information.



- b. Enter the highlighted information.



6. Click **Check in** to save and exit.

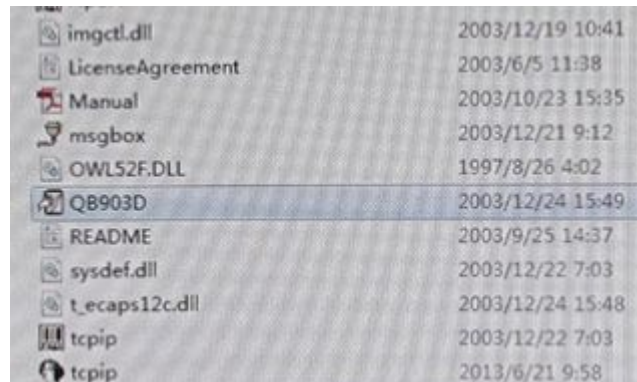
Installing and Setting Up the ECG Viewer II

Install the **ECG Viewer II** with the installation CD.

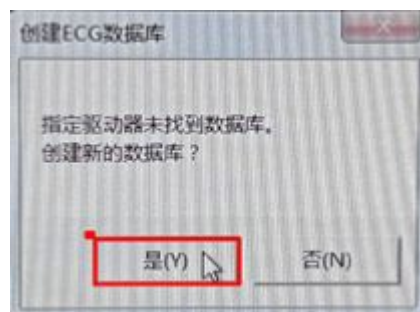
NOTE:

Some programs of the **ECG Viewer** can be run only when the installation CD remains in the drive.

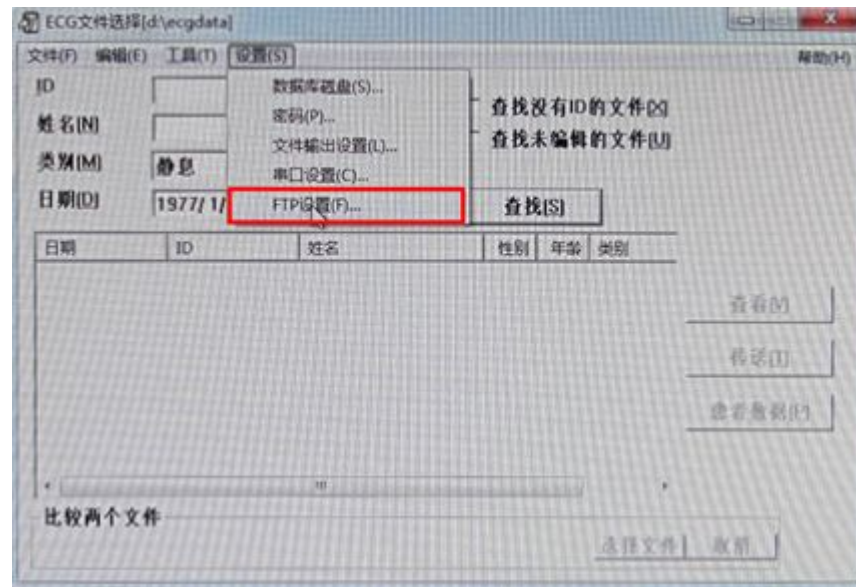
1. Select the installation directory and run **QB903D**.



2. Create the Database accordingly.



3. Access the **FTP Setup** by selecting **Setup > FTP Setup** in the **ECG File Select** window.



4. Make the following settings as shown in the following illustration.

5. The **FTP** window will open, click **OK** to restart **QB903D**.



Setting Up the Transmission Layer

This section demonstrates how to setup the transmission layer used in the third-party ECG Data solution.

FTP Transmission Layer Example

Demonstration Environment

FTP Server	Quick Easy FTP Server
Third-Party Device	Fukuda CardiMax FX-7202

Installing the FTP Server

1. Double-click the FTP server installation.
The **Welcome** window opens.

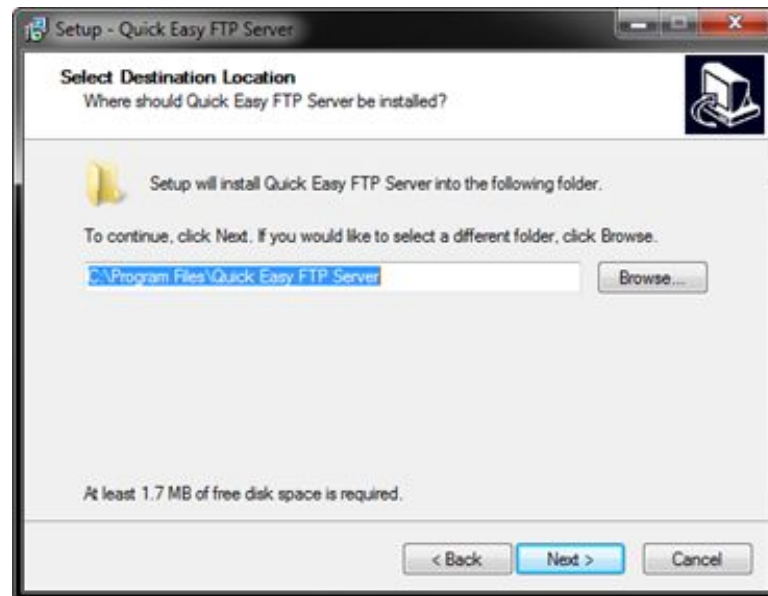


2. Click **Next**.
The **License Agreement** window opens.



3. Select **I accept the agreement**, and click **Next**.
The **Select Destination Location** window opens.

4. Click **Browse** to select the location where you want to install the FTP server.



5. Click **Next**.
The **Select Start Menu Folder** window opens.



6. Click **Browse** to select a different folder.
7. Click **Next**.
The **Select Additional Tasks** window opens.

If you want to create a desktop icon for this FTP server, select the **Create a desktop icon** check box.

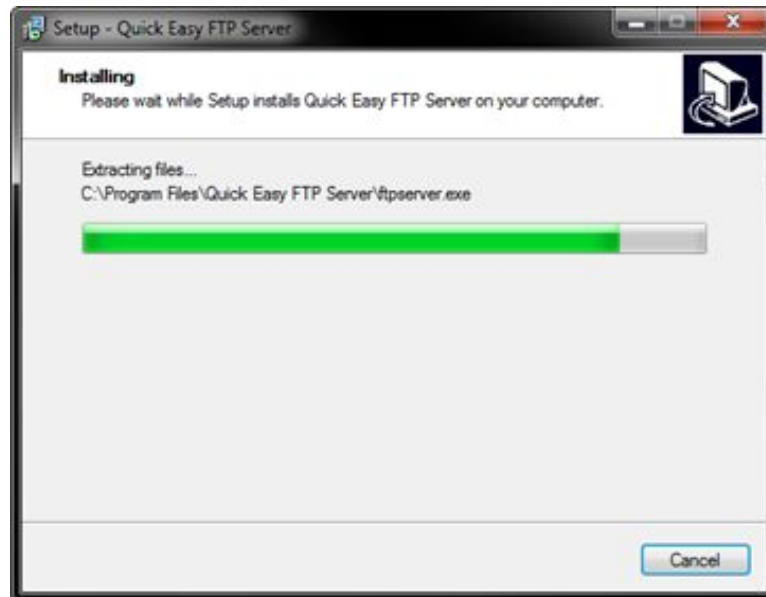


8. Click **Next**.
The **Ready to Install** window opens.



Review the information to make sure it is correct. If you want to make a change, click **Back** and you will go back to the previous windows.

9. Click **Install**.
The installation begins.



10. After the installation is finished, click **OK** to finish and exit the installation.

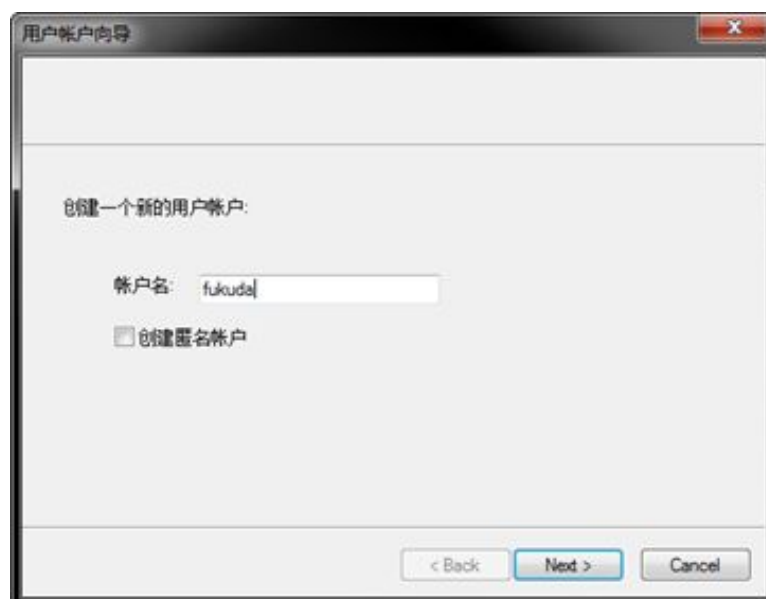
Creating a New FTP Server Account

The first time you run the FTP server, the configuration guide will display.

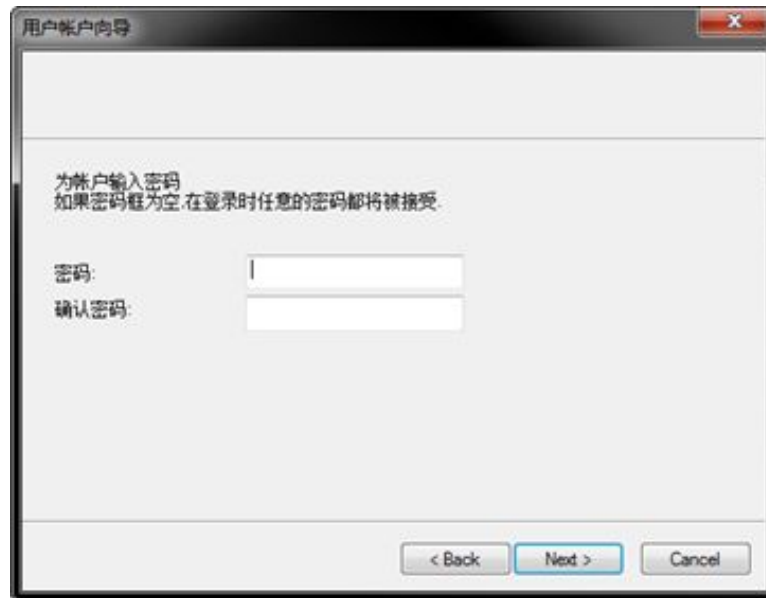
1. Run the FTP server by double-clicking the FTP server shortcut icon on the desktop.

The **Create a new account** window opens.

2. Type the **User Name**.



3. Click **Next**.
The **Enter the password** window opens.
4. Type the **Password** in the **Password** field.
5. Type the password again to confirm it in the **Confirm Password** field.



6. Click **Next**.
The **Root Directory for the account** window opens.
7. Click **Browse** to choose the location that you want to make as the Root Directory.



8. Click **Next**.
The **Permission settings** window opens.

9. Enable all the functions listed in the window by selecting the check boxes next to each function..



10. Click **Next**.
The **Your account has been created successfully** window opens.
11. Click **Finish** to finish the configuration.



Starting the Server

After creating a new FTP server account, the FTP server configuration utility opens automatically.

1. Click **Server Configuration** to open the **Server Configuration** window.



2. Enter the following information:

- **Server IP**
- **Server Port**



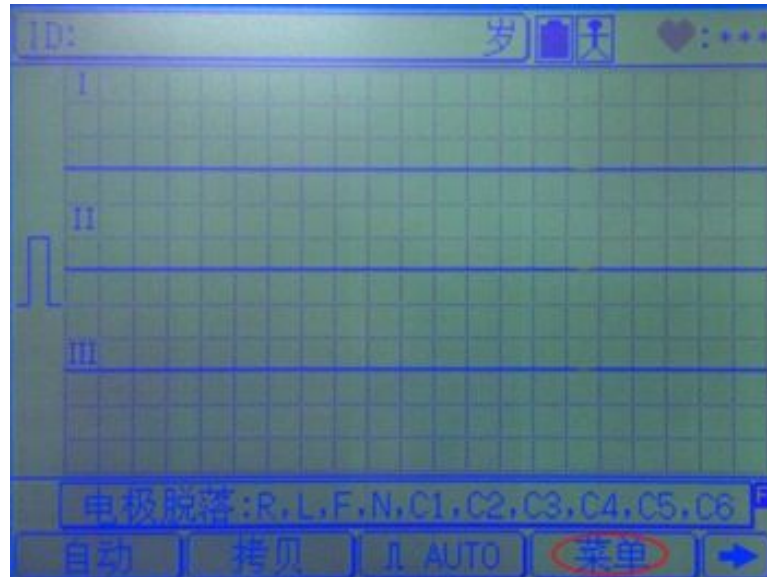
3. Start the server by clicking the **Start** button.



The server is now started.

Configuring the CardiMax FX-7202

1. Power on the CardiMax FX-7202.
2. In the Main window, click **Menu**.



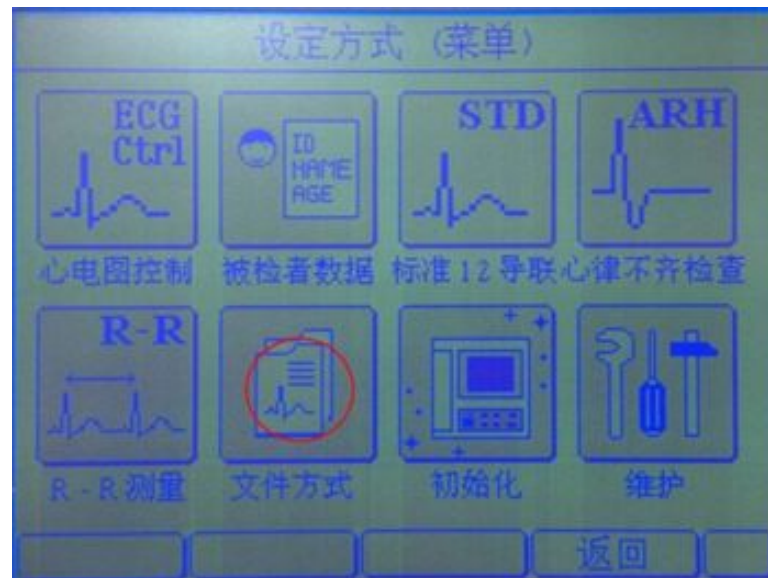
The **Mode Select** window opens.

3. Select **Setup**.



The **Setup (Menu)** window opens

4. Select **File**.



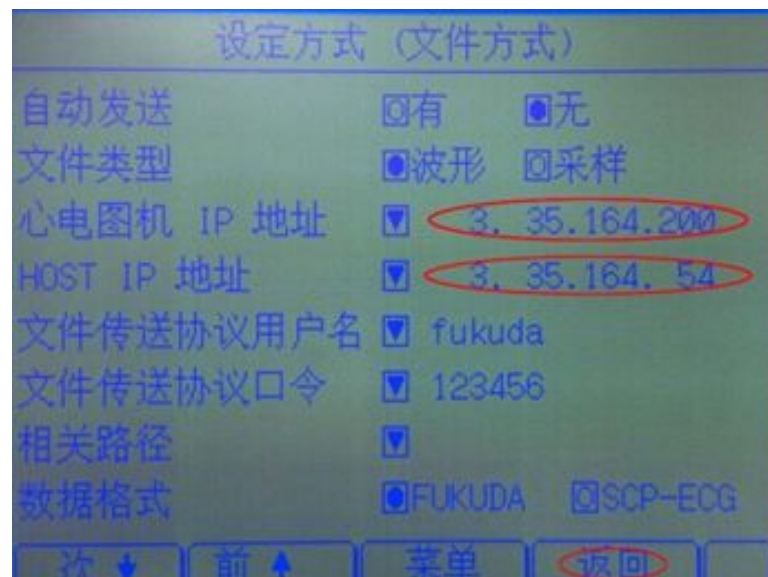
The **Setup (File)** window opens.

5. Enter **ECG Device IP Address** and **HOST IP Address** by clicking the buttons next to the field names.

NOTE:

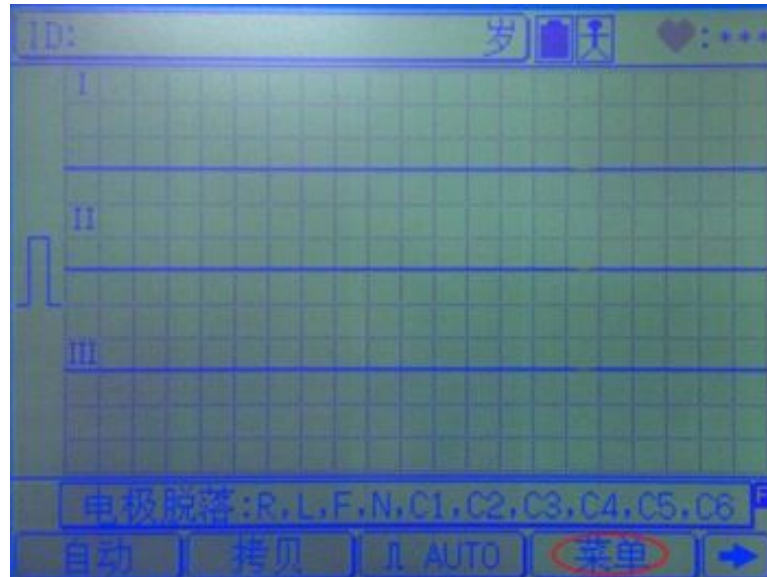
The CardiMax FX-7202 does not support DHCP.

The HOST IP address is the IP address of the FTP server.



Sending Data to the FTP Server

1. Acquire ECG data on the ECG device.
2. In the Main window, click **Menu**.



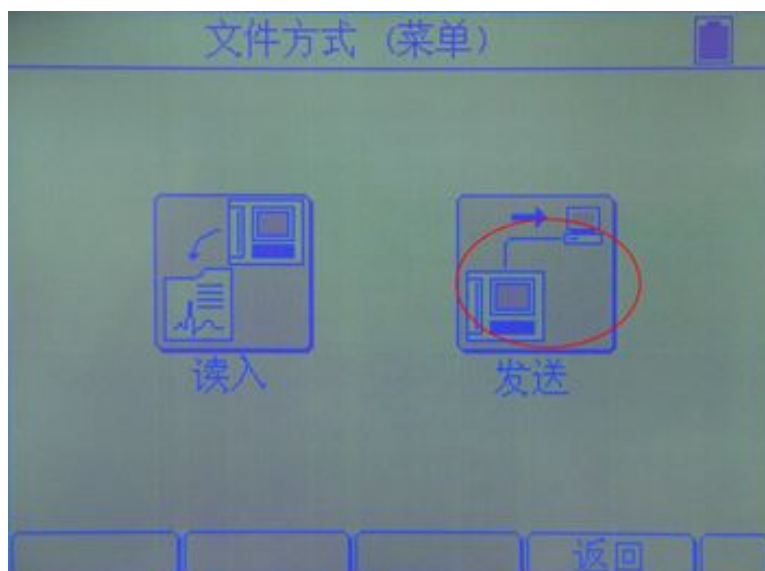
The **Mode Select** window opens.

3. Select **File**.



The **File (Menu)** window opens.

4. Click **Send**.



The **Sending ECG Data** window opens.

5. Click **Media**.



The ECG records on the media are listed in the window.

6. Select the records that you want to send, and click **Send**.



NO.	ID No.	DATE/TIME	SEX	AGE
1	123456	2012/ 6/14 14:34:03		
2	12345678	2012/ 6/13 15:38:22		
3	88888888	2012/ 6/13 15:28:30	M	65
4	12345678	2012/ 6/13 15:17:36		
5	12345678	2012/ 6/13 15:12:11		
6	369	2012/ 6/ 8 13:34:12	F	56
7		2012/ 6/ 8 13:33:00		
8		2012/ 6/ 5 10:45:46		
9	1	2012/ 6/ 5 10:20:57	F	21
10	1234567890123456	2012/ 6/ 5 10:13:39	M	26

Buttons: 发送 (Send), 检索 (Search), 菜单 (Menu)

7. A message displays indicating the progress.
Wait until all the records have been sent.

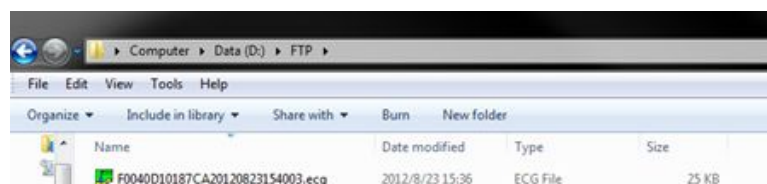


NO.	ID No.	DATE/TIME	SEX	AGE
1	123456	2012/ 6/14 14:34:03		
2	12345678	2012/ 6/13 15:38:22		
3	88	2012/ 6/13 15:28:30	M	65
4	12	2012/ 6/13 15:17:36		
5	12	2012/ 6/13 15:12:11		
6		2012/ 6/ 8 13:34:12	F	56
7		2012/ 6/ 8 13:33:00		
8		2012/ 6/ 5 10:45:46		
9	1	2012/ 6/ 5 10:20:57	F	21
10	1234567890123456	2012/ 6/ 5 10:13:39	M	26

Buttons: 发送 (Send), 检索 (Search), 菜单 (Menu)

Checking Transmitted Data

Check the FTP root folder to make sure an ECG file exists.



The Parser Layer

The parser layer parses the data from a third-party device, converts it to the system compatible format, and send it to the system server. The parser layer is the core of this solution. It consists of a framework, a configurator, and several parsers.

The configurator modifies the configuration file, which defines how the framework works.

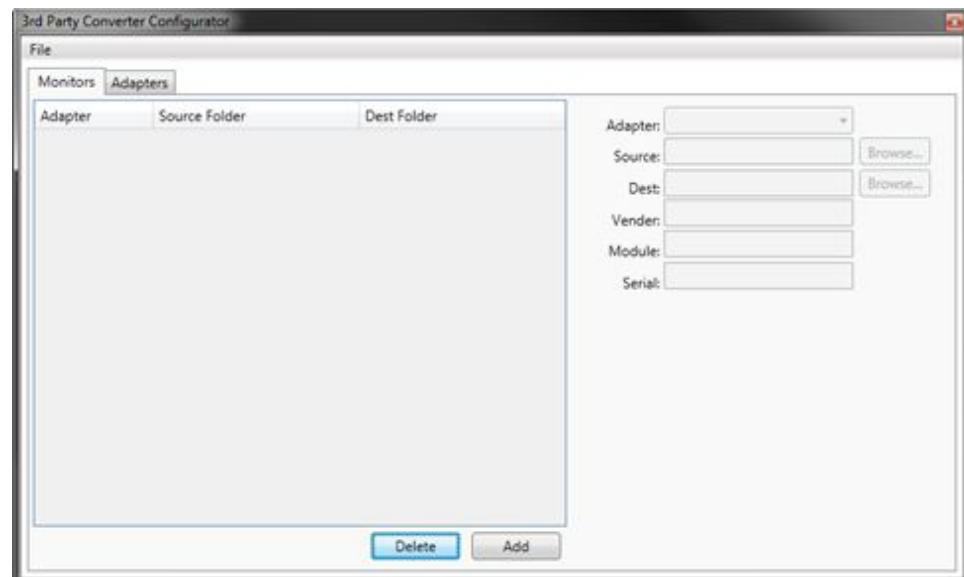
The parsers are each dedicated to a specific device, parsing data from the device.

The framework reads the configuration file, which must be named **ConverterConfig.xml**, loads the parser, and allows everything to work together.

Configuring the Parser

1. Run the configurator.

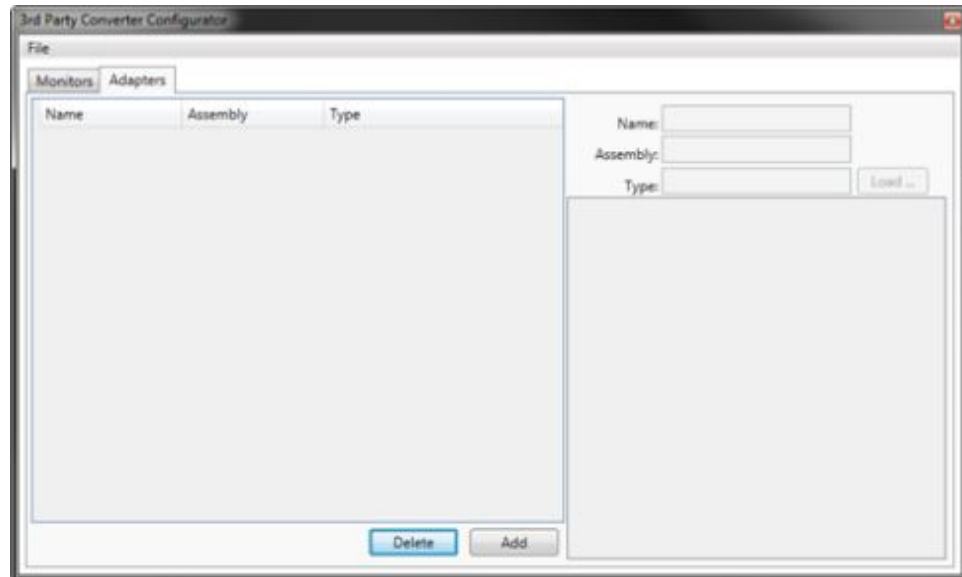
The **3rd Party Convert Configurator** window opens.



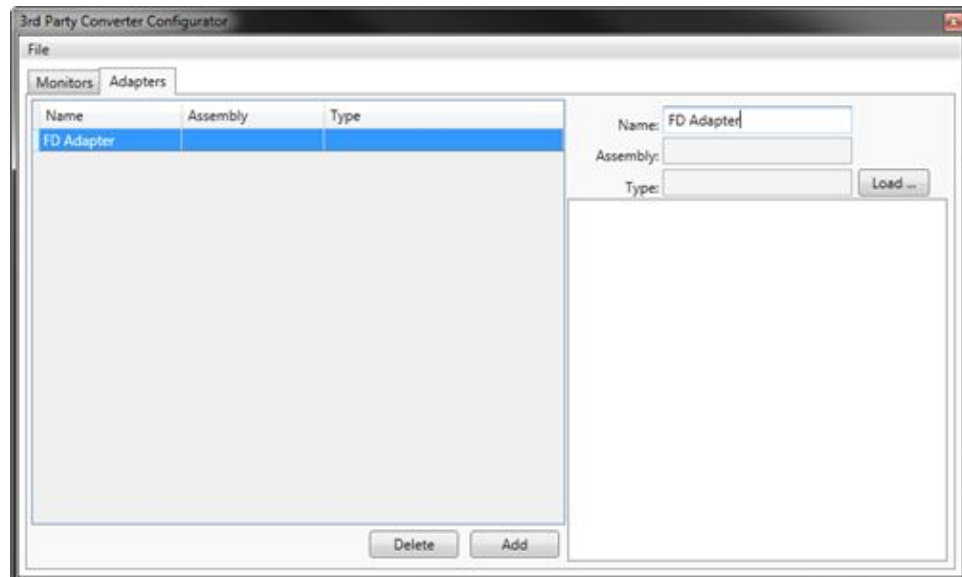
The configurator has two major functions.

- Defining parsers, which is done in the **Adapters** tab.
- Defining monitors, which is down in the **Monitors** tab.

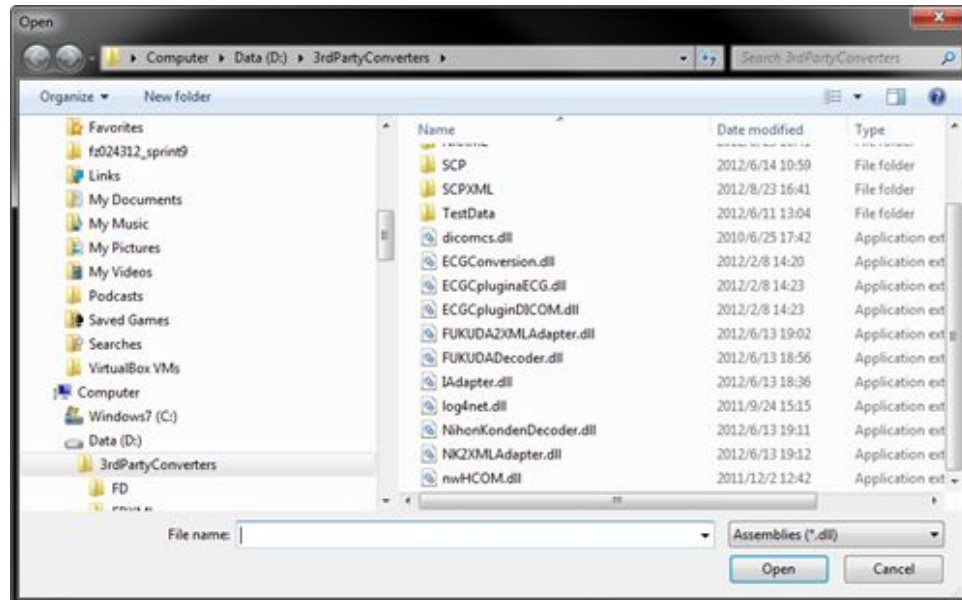
2. At the **Adapters** tab, click **Add**.



3. Type a new parser name in the **Name** field and click **Load**.

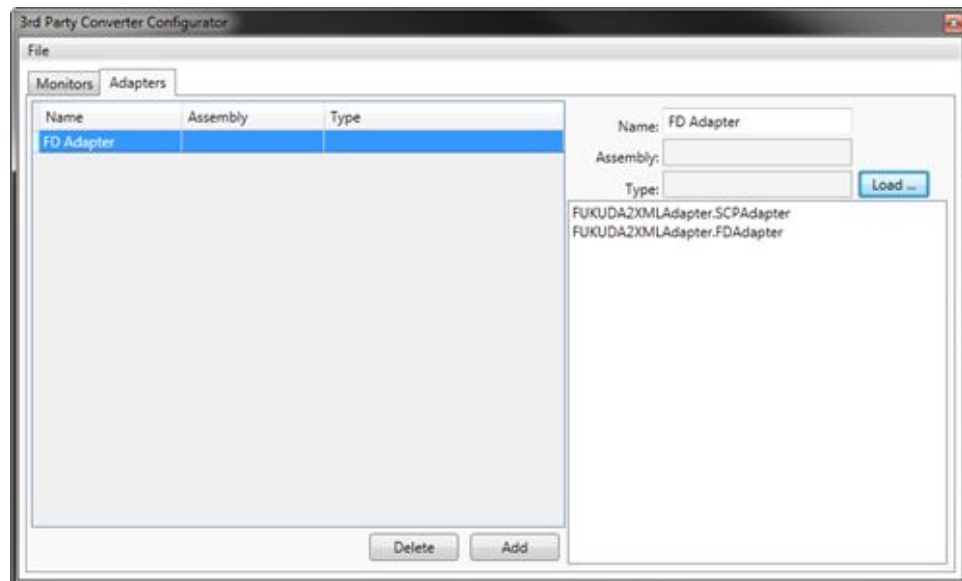


4. Select an assembly where there is a parser, such as **FUKUDA2XMLAdapter.dll**.

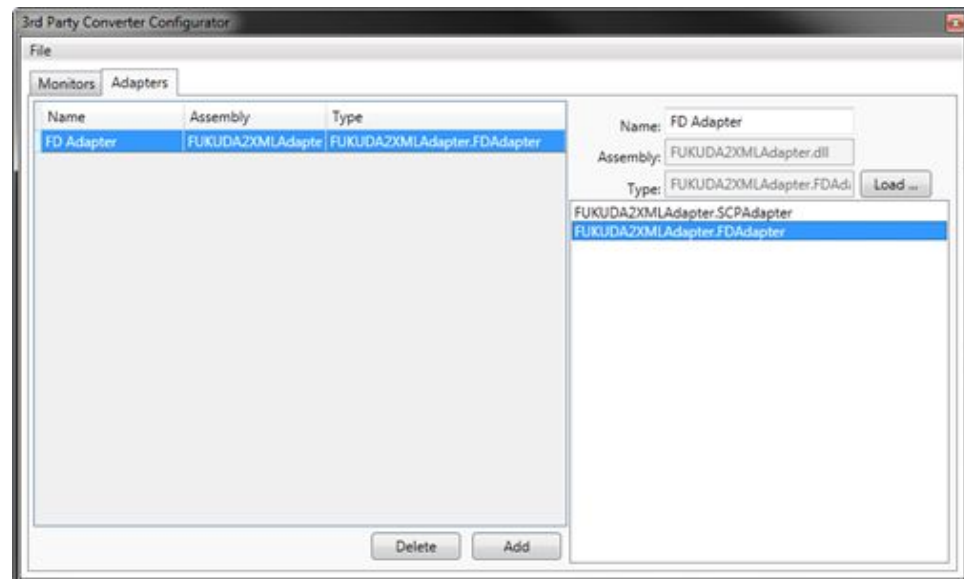


The parser/adapter in the assembly will be listed.

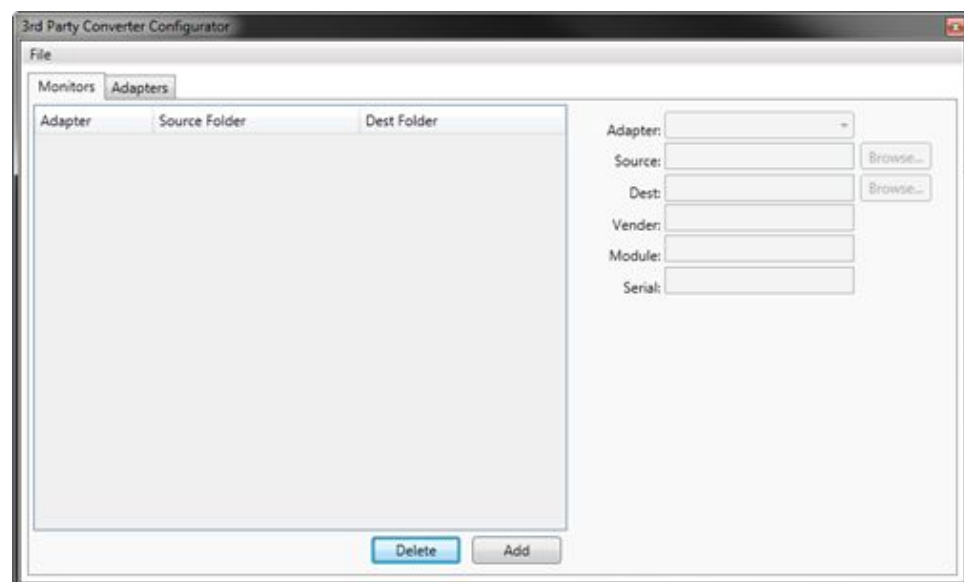
For example, as indicated in the following figure the **FUKUDA2XMLAdapter.SCPAdapter** and **FUKUDA2XMLAdapter.FDAdapter** are listed.



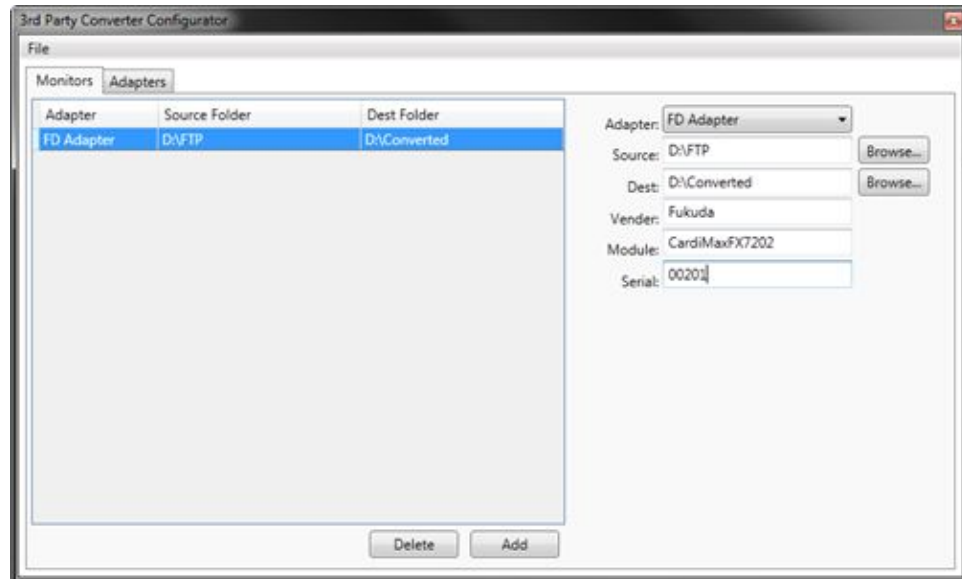
5. Select the appropriate adapter and click **Add**.



6. Click the **Monitors** tab, and click **Add**.



7. Select an Adapter/Parser.

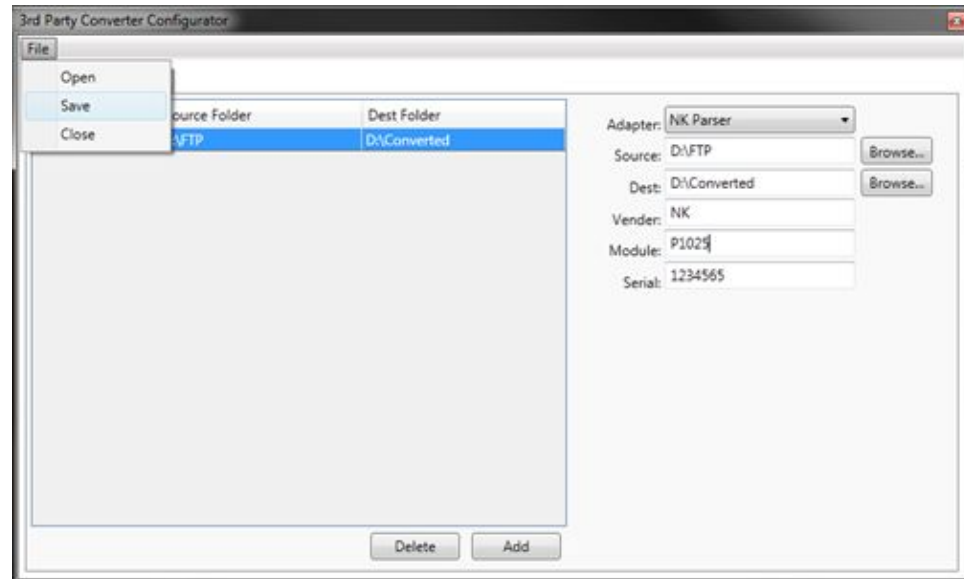


Add the information to the other fields as follows:

Field	Description	Required
Source	This is the path where the third-party data is located.	Yes
Dest	This is the path where the converted data will be located.	Yes
Vender	Vender of the device.	Yes
Module	Device name.	Yes
Serial	Device serial number.	Yes

Each added item will start a thread for converting data.

8. Save the configuration by selecting **File > Save**. The saved file name must be **ConverterConfig.xml**.



Running the Parser

To run the parser, click the **ThirdPartyDataConverter.exe**.

The following window opens.



Transmitting Files

1. Transmit a file from the FUKUDA device.
2. Open the **D:\Converted** folder.

If the file transmitted successfully, you will find an XML file similar to the following, in the **D:\Converted** folder:

[illegible]

Optima EMS Folder for Each Device

A device needs to be configured before any acquisition work is done.

The system server will create a folder for each device under the current site's folder.

For example, a folder on the server named **D:\somefolder** with the shared name of **MACIT ECG Data** on the **Minhang** site, should have a folder named **D:\somefolder\Minhang** on the **Minhang** site.

If the device **p1025** is added to the **Minhang** site, there will be a folder named **D:\somefolder\Minhang\p1025**. This folder is where the data from **p1025** will be stored and all data going into that folder will be coming from the device **p1025**.

It is the configurator's responsibility to route the converted xml file to the correct folder.

Third-Party ECG Data Solution Detailed Design

The System Compatible XML Format

This XML format is the data convention between the system and any third-party system. The system can process data from any system as long as it supports the Compatible XML Format.

Following is the XML format schema.

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema attributeFormDefault="unqualified" elementFormDefault="qualified"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="RestingECG">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="Patient" minOccurs="1" maxOccurs="1">
          <xs:complexType>
            <xs:attribute name="id" type="xs:string" use="optional" />
            <xs:attribute name="name" type="xs:string" use="optional" />
            <xs:attribute name="gender" type="xs:string" use="optional" />
            <xs:attribute name="ageUnit" type="xs:string" use="optional" />
            <xs:attribute name="age" type="xs:unsignedInt" use="optional" />
            <xs:attribute name="height" type="xs:unsignedInt" use="optional" />
            <xs:attribute name="weight" type="xs:unsignedInt" use="optional" />
          </xs:complexType>
        </xs:element>
        <xs:element name="Device" minOccurs="1" maxOccurs="1">
          <xs:complexType>
```

```

        <xs:attribute name="vender" type="xs:string" use="required" />
        <xs:attribute name="module" type="xs:string" use="required" />
        <xs:attribute name="serial" type="xs:string" use="required" />
    </xs:complexType>
</xs:element>
<xs:element name="DiagnosisResult" minOccurs="0" maxOccurs="1">
    <xs:complexType>
        <xs:attribute name="text" type="xs:string" use="required" />
    </xs:complexType>
</xs:element>
<xs:element name="Measurements" minOccurs="0" maxOccurs="1">
    <xs:complexType>
        <xs:attribute name="atrialRate" type="xs:unsignedShort" use="optional" />
        <xs:attribute name="ventRate" type="xs:unsignedShort" use="optional" />
        <xs:attribute name="pOn" type="xs:unsignedShort" use="optional" />
        <xs:attribute name="pOff" type="xs:unsignedShort" use="optional" />
        <xs:attribute name="qOn" type="xs:unsignedShort" use="optional" />
        <xs:attribute name="qOff" type="xs:unsignedShort" use="optional" />
        <xs:attribute name="tOff" type="xs:unsignedShort" use="optional" />
        <xs:attribute name="sysBp" type="xs:unsignedShort" use="optional" />
        <xs:attribute name="diaBp" type="xs:unsignedShort" use="optional" />
        <xs:attribute name="prInterval" type="xs:unsignedShort" use="optional" />
        <xs:attribute name="qrsDuration" type="xs:unsignedShort" use="optional" />
        <xs:attribute name="qtInterval" type="xs:unsignedShort" use="optional" />
        <xs:attribute name="qtc" type="xs:unsignedShort" use="optional" />
        <xs:attribute name="qtcFred" type="xs:unsignedShort" use="optional" />
        <xs:attribute name="qtcFram" type="xs:unsignedShort" use="optional" />
        <xs:attribute name="pAxis" type="xs:short" use="optional" />
        <xs:attribute name="rAxis" type="xs:short" use="optional" />
        <xs:attribute name="tAxis" type="xs:short" use="optional" />
        <xs:attribute name="qrsCount" type="xs:unsignedShort" use="optional" />
    </xs:complexType>
</xs:element>
<xs:element name="WaveData" minOccurs="1" maxOccurs="1">
    <xs:complexType>
        <xs:sequence>
            <xs:element name="Summary" minOccurs="1" maxOccurs="1">
                <xs:complexType>

```



```

<xs:attribute name="precesion" type="xs:decimal" use="required" />
<xs:attribute name="sampleRate" type="xs:unsignedShort" use="required"
/>
<xs:attribute name="rhythmsDuration" type="xs:unsignedShort"
use="required" />
<xs:attribute name="lowPassFilter" type="xs:double" use="optional" />
<xs:attribute name="hightPassFilter" type="xs:double" use="optional" />
</xs:complexType>
</xs:element>
<xs:element name="Medians" minOccurs="0" maxOccurs="1">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="8" maxOccurs="12" name="Lead">
        <xs:complexType>
          <xs:attribute name="id" type="xs:string" use="required" />
          <xs:attribute name="samples" type="xs:unsignedShort"
use="required" />
          <xs:attribute name="value" type="xs:string" use="required" />
        </xs:complexType>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="Rhythms" minOccurs="1" maxOccurs="1">
  <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="8" maxOccurs="12" name="Lead">
        <xs:complexType>
          <xs:attribute name="id" type="xs:string" use="required" />
          <xs:attribute name="samples" type="xs:unsignedShort"
use="required" />
          <xs:attribute name="value" type="xs:string" use="required" />
        </xs:complexType>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:element>
</xs:sequence>
</xs:complexType>

```

```

        </xs:element>
    </xs:sequence>
    <xs:attribute name="acquiredDateTime" type="xs:dateTime" use="optional"/>
</xs:complexType>
</xs:element>
</xs:schema>

```

Schema Definitions

Element	Attribute	Definition
Patient	ID	Patient ID, which should be unique in site scope.
	Name	Patient name/family name/given name. The maximum length is 20 bytes.
	Gender	Enumeration values: Male, Female.
	AgeUnit	Enumeration values: Year, Month, Week Day.
	Age	Patient age. The attribute works with the AgeUnit attribute to describe patient age.
	Height	Patient height. Unit is centimeter.
	Weight	Patient weight. Unit is kilogram.
Device	Vender	Device Vender. Maximum length is 50 bytes.
	Module	Device Type. Maximum length is 50 bytes.
	Serial	Device serial number. Maximum length is 50 bytes.
DiagnosisResult	Text	Diagnosis text. Maximum length is 1024 bytes.
Measurements	atrialRate	Atrial rate. Unit is beats/minute.
	ventRate	Ventricular rate. Unit is beats/minute.
	pOn	P onset time. Unit is ms.
	pOff	P offset time. Unit is ms.
	qOn	Q onset time. Unit is ms.
	qOff	Q offset time. Unit is ms.
	tOff	T offset time. Unit is ms.

Schema Definitions (cont'd.)

			sysBp	Systolic blood pressure. Unit is mmHg.
			diaBp	Diastolic blood pressure. Unit is mmHg.
			prInterval	PR interval. Unit is ms.
			qrsDuration	QRS duration. Unit is ms.
			qtInterval	QT interval. Unit is ms.
			qtc	QTC. Unit is ms.
			qtcFred	QTC Fridericia. Unit is ms.
			qtcFram	QTC Fram. Unit is ms.
			pAxis	P Axis. Unit is degree.
			rAxis	R Axis. Unit is degree.
			tAxis	T Axis. Unit is degree.
			qrsCount	QRS count. Unit is heartbeat.
WaveData	Summary		Precesion	Must be 4.88uV.
			SampleRate	Must be 500Hz, if not, resample original data.
			RhythmsDuration	Must be 10 second. The system only supports 10s ECG.
			LowPassFilter	Low pass filter when acquiring the wave data. Unit is Hz.
			HightPassFilter	High pass filter when acquiring the wave data. Unit is Hz.
	Medians	ID	Lead ID	ECG Lead ID definition, see the Lead ID Definition table.
		Samples	Samples	Must be 600 (1.2 s)
		Value	Value	The lead sample values separated with white spaces.
	Rhythms	ID	Lead ID	ECG lead ID definition, see the Lead ID Definition table.
		Samples	Samples	Must be 5000 for 10 seconds ECG data.
		Value	Value	The lead sample values separated with white spaces.
	acquiredDateTime			The date and time when this data is acquired.

Available lead IDs in the system are: (All lead IDs are case-sensitive).

Lead ID Definition

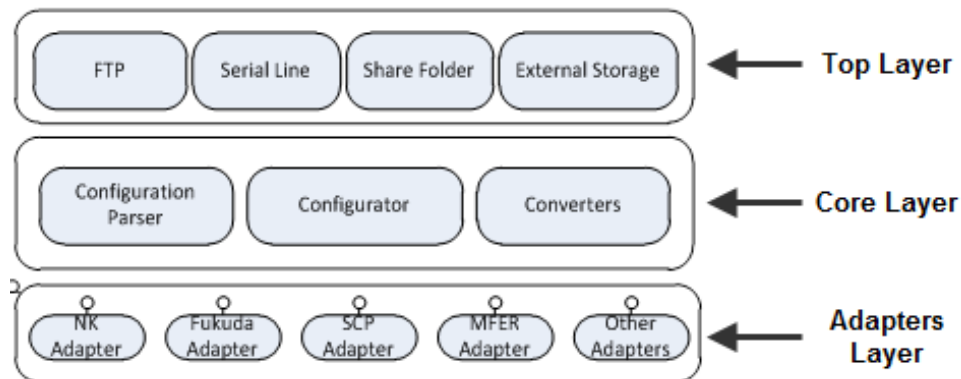
Lead ID	Comments
<i>I</i>	I lead in waveform.
<i>II</i>	II lead in waveform.
<i>III</i>	III lead in waveform.
<i>aVL</i>	aVL lead in waveform.
<i>aVR</i>	aVR lead in waveform.
<i>aVF</i>	aVF lead in waveform.
<i>V1</i>	V1 lead in waveform.
<i>V2</i>	V2 lead in waveform.
<i>V3</i>	V3 lead in waveform.
<i>V4</i>	V4 lead in waveform.
<i>V5</i>	V5 lead in waveform.
<i>V6</i>	V6 lead in waveform.
<i>V7</i>	V7 lead in waveform.
<i>V8</i>	V8 lead in waveform.
<i>V9</i>	V9 lead in waveform.
<i>V2R</i>	V2R lead in waveform.
<i>V3R</i>	V3R lead in waveform.
<i>V4R</i>	V4R lead in waveform.
<i>V5R</i>	V5R lead in waveform.
<i>V6R</i>	V6R lead in waveform.
<i>V7R</i>	V7R lead in waveform.
<i>V8R</i>	V8R lead in waveform.
<i>V9R</i>	V9R lead in waveform.
<i>X</i>	X lead in waveform.
<i>Y</i>	Y lead in waveform.
<i>Z</i>	Z lead in waveform.
<i>mX</i>	mX lead in waveform.
<i>mY</i>	mY lead in waveform.
<i>mZ</i>	mZ lead in waveform.
<i>Xd</i>	Xd lead in waveform.
<i>Yd</i>	Yd lead in waveform.
<i>Zd</i>	Zd lead in waveform.
<i>mXd</i>	mXd lead in waveform.

Lead ID Definition (cont'd.)

<i>mYd</i>	mYd lead in waveform.
<i>mZd</i>	mZd lead in waveform.
<i>NEHB_D</i>	NEHB_D lead in waveform.
<i>NEHB_A</i>	NEHB_A lead in waveform.
<i>NEHB_J</i>	NEHB_J lead in waveform.
<i>ML</i>	ML lead in waveform.
<i>CH</i>	CH lead in waveform.
<i>A1</i>	A1 lead in waveform.
<i>A2</i>	A2 lead in waveform.
<i>A3</i>	A3 lead in waveform.
<i>A4</i>	A4 lead in waveform.

Third-Party Solution Architecture

The following figure is the architecture of the third-party ECG data solution.



The Top Layer

The top layer is the transmission layer responsible for receiving data from third-party devices. The methods for receiving data in this solution are general FTP, shared folder, and external storage (SD Card, USB Disk, and so on). The serial line approach needs specialized software support, which is generally bundled with devices.

The Core Layer

The middle layer is the core part of this solution, it contains three parts: the configuration, the configurator, and the converters.

The configuration reads and writes the configuration file. Configurator modifies the configuration files. Converters are organized by the rules in configuration files and converts the third-party data.

The configuration file schema is as follows:

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xs="http://www.w3.org/2001/
/XMLSchema" attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="http://parser.3rdParty.com">
  <xsd:element name="Configuration">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="Adapters">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="Adapter">
                <xsd:complexType>
                  <xsd:attribute name="Name" type="xsd:string" use="required" />
                  <xsd:attribute name="Assembly" type="xsd:string" use="required" />
                  <xsd:attribute name="Type" type="xsd:string" use="required" />
                </xsd:complexType>
              </xsd:element>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:element name="Monitors">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element name="Monitor">
          <xsd:complexType>
            <xsd:attribute name="Adapter" type="xsd:string" use="required" />
            <xsd:attribute name="Source" type="xsd:string" use="required" />
            <xsd:attribute name="Dest" type="xsd:string" use="required" />
            <xsd:attribute name="Vender" type="xsd:string" use="required" />
            <xsd:attribute name="Module" type="xsd:string" use="required" />
            <xsd:attribute name="Serial" type="xsd:unsignedByte" use="required" />
          </xsd:complexType>
        </xsd:element>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
</xs:schema>
```

```

    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
</xs:schema>

```

There are two elements in the configuration file: **Adapters** and **Monitors**.

Adapters describe the adapters which will be created. **Monitors** describe the monitoring threads that will be created.

Adapters and **Monitors** are related to the **Adapter.Name** and **Monitor.Adapter** attributes.

Following is a sample of a configuration file. This configuration indicates there is a monitoring thread, which makes use of the NKType2 adapter, and monitoring the **D:\Source** folder. If there are any files in the **D:\Source** folder, the monitor will try to convert it to the system compatible XML file and then save the XML file to **D:\dest** folder.

```

<?xml version="1.0" encoding="utf-8"?>
<Configuration xmlns="http://parser.3rdParty.com">

  <Adapters>
    <Adapter Name="NKType2" Assembly="NK2XMLAdapter.dll" Type=
      "NK2XMLAdapter.Adapter" />
  </Adapters>
  <Monitors>
    <Monitor Adapter="NKType2" Source="D:\Source" Dest="d:\Dest" Vender="NK"
      Module="P1025" Serial="12345" />
  </Monitors>
</Configuration>

```

Configuration File Schema Descriptions

Element	Attribute	Description
Adapter	Name	Adapter Name
	Assembly	The assembly file, where this adapter is located.
	Type	The full name, including namespace, of the adapter.

Configuration File Schema Descriptions (cont'd.)

Monitor	Adapter	Name of the adapter used by this monitor.
	Source	The folder being monitored.
	Dest	The destination folder of the converted system compatible XML file.
	Vender	Device vender. The value of this field will be copied to the converted XML file.
	Module	Device module. The value of this field will be copied to the converted XML file.
	Serial	Device serial. The value of this field will be copied to the converted XML file.

The Adapters Layer

The Adapters layer provides flexibility that it could be extended by arbitrary adapters. To achieve this flexibility a configuration file, a configurator, and dependency injection technology are employed.

All adapters will need to implement the following interface.

```
public interface IAdapter
{
    string ToXML(string rawFileName);
}
```

This interface converts third-party data to the system compatible XML format.

5

Third-Party ECG Data Extensibility

To add an additional adapter, perform the following procedure:

1. Develop an adapter which implements the IAdapter interface. (For developer only).
2. Copy the assembly containing the adapter to the install path.
3. Run the configurator, and open the existing configuration file.
4. Use the adapter editor to load the newly added assembly.
5. Add an adaptername, the adapter, and set the assembly and type.
6. Use the monitor editor to add a monitor. Set the adapter filed to the newly added adapter, and set the source and destination folder according to the requirement.
7. Save the configuration file.
8. Restart the ***ThirdPartyDataConverter***.



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