

GE Healthcare

MAC™ 7 Resting ECG Analysis System

Operator's Manual

Version 1

2109599-001E

Keep this manual with your Regulatory and Safety Manual and equipment at all times, and periodically review it.



MAC™ 7 Resting ECG Analysis System
Operator's Manual
English
© 2020-2021 General Electric Company
All Rights Reserved.

Publication Information

The information in this manual applies only to 1.00 of MAC™ 7 Resting ECG Analysis System. It does not apply to earlier product versions. Due to continuing product innovation, specifications in this manual are subject to change without notice.

12SL, CASE, CardioSoft, InSite ExC, MAC, MACCRA, MARS, MUSE, Marquette, MobileLink, and MULTI-LINK are trademarks owned by GE Medical Systems *Information Technologies*, Inc., a General Electric Company going to market as GE Healthcare. All other trademarks contained herein are the property of their respective owners.

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



Date of first CE mark - 2020.

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

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

Revision	Date	Comment
A	6 March 2020	Customer Release
B	3 July 2020	Update legal manufacturer and registration information
C	11 December 2020	Update content for Software SP02
D	9 April 2021	Update content for Software SP03
E	10 September 2021	Update cleaning and disinfection information

Access other GE Healthcare Diagnostic Cardiology documents at the Customer Documentation Portal. Go to <https://www.gehealthcare.com/en/support/support-documentation-library> and scroll to the bottom of the page.

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

Third-party Licenses

This product includes software developed by:

- Linux Kernel organization (<https://www.kernel.org>)
- NXP Semiconductors (<https://www.nxp.com>)
- Apache Software Foundation (<http://www.apache.org>)
- OpenSSL.org (<http://www.openssl.org>)
- OpenSSH (<https://www.openssh.com/>)
- GNU Foundation packages (<https://www.gnu.org>)
- Gentoo software (<https://packages.gentoo.org>)
- Boost Libraries (<http://www.boost.org>)
- POCO Project (<https://pocoproject.org>)
- Debian packages (<https://packages.debian.org>)
- Yocto project packages (<https://www.yoctoproject.org>)
- Freedesktop.org (<https://www.freedesktop.org>)
- Busybox project (<https://busybox.net>)
- bzip.org (<http://www.bzip.org>)

- FreeType project (<https://www.freetype.org>)
- OpenBSD Project (<https://www.openbsd.org>)
- netfilter.org project (<http://www.netfilter.org>)
- netcat (<http://netcat.sourceforge.net/>)
- OpenLDAP Project (<https://www.openldap.org>)
- ws4d.org (<http://ws4d.org/projects>)
- JS Foundation (<https://js.foundation>)
- ANGULARJS (<https://angularjs.org>)
- QT-labs (<https://github.com/qt-labs>)
- Massachusetts Institute of Technology (<https://web.mit.edu>)
- Cyrus IMAP org (<https://www.cyrusimap.org>)
- rsyslog (<https://www.rsyslog.com>)
- sshpass (<https://sourceforge.net/projects/sshpass/>)

License details of the software used in the product can be viewed in the online help in the *Open Source Licenses* section. Contact GE Service to obtain the source code of the open-source software used in the product, if required.

This document describes the MAC™ 7 Resting ECG Analysis System, also referred to as the “product”, “system”, or “device”. This document is intended to be used by an operator of the MAC™ 7 Resting ECG Analysis System system.

The MAC™ 7 Resting ECG Analysis System is intended to be used under the direct supervision of a licensed healthcare practitioner, by trained operators in a hospital or facility providing patient care.

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

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

Support

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

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

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

Training

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

To see available training, go to the GE Healthcare training website www.gehealthcare.com/training.

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

Table of Contents

Publication Information.....	2
1: Product Overview.....	7
Front View.....	7
Side and Rear View.....	8
Acquisition Screen Overview.....	9
User Menu Options Description.....	12
Battery Status.....	14
Show Battery Status.....	15
Show Network Connection Status.....	16
Change the Brightness of the Screen.....	17
2: Login and Security.....	18
Power On the ECG Device.....	18
Power Off the ECG Device.....	18
User Authentication.....	19
Log On to the Device.....	20
Log On the Device as a STAT User.....	22
Access the Device using a Technician ID.....	22
Log Out of the Device.....	22
Change the User Password.....	23
Activate or Deactivate Privacy Mode.....	23
Lock the Device.....	24
Unlock the Device.....	24
Put the Device on Standby.....	24
Perform System Reset.....	25
3: Patient Information.....	26
Patient Information Screen Overview.....	26
Start a Test for a New Patient.....	28
Enter Patient Information.....	29
Update Patient Information with a Barcode Reader.....	29
Query Orders or ADT for Patient Demographics.....	30
Enter or Edit Patient Information Using the Software Keyboard.....	36
4: Record an ECG or Rhythm.....	38
Hookup Advisor Overview.....	38
Acquire an ECG based on the Hookup Advisor status in Post-Acquisition Mode.....	41
Acquire an ECG based on the Hookup Advisor status in Pre-Acquisition Mode.....	41
Change Lead Sets and Lead Formats.....	41
Enable ACS Interpretation.....	42
Change Speed, Gain, and Filter.....	43
ECG Acquisition Overview.....	44
Automatically Acquire an ECG.....	44
Manually Start an ECG recording.....	45
Cancel an ECG.....	47
Accept or Reject an ECG Patient Report.....	47
Review an ECG Patient Report.....	51

Automatically Print an ECG Patient Report.....	53
Record a Rhythm.....	54
Review a Digital Rhythm Report.....	56
Transmit a Patient Report to a Configured Destination.....	57
Print a Patient Report.....	60
Edit Patient Information in a Patient Report.....	62
Delete a Patient Report.....	62
View the Patient Report.....	63
Close a Patient Report.....	63
Full Disclosure Overview.....	64
Record a Full Disclosure ECG.....	64
Review a Full Disclosure Report.....	66
5: Work with Orders.....	68
Automatically Update the Orders List.....	71
Manually Update the Orders List.....	71
Sort Orders in the Orders List.....	72
Filter Orders in the Orders List.....	72
Attach an Order when the Patient Test is Not Started.....	75
Attach an Order to a New Patient Test.....	75
Attach an Order when the Patient Test is Completed.....	76
Attach an Order that is Attached to a Different Patient Test.....	77
Change the Order Attached to a Patient Test.....	78
Detach an Order from a Patient Test.....	78
Order Status.....	79
6: Work with the Files List.....	81
Review a Stored Patient Report.....	83
Transmit a Stored Patient Report to a Configured Destination.....	85
Print a Stored Patient Report.....	88
Print a List of Stored Records.....	90
Edit Patient Information in a Stored Patient Report.....	90
Delete Stored Patient Reports from the Files List.....	91
7: Work with the Queue List.....	93
Display the Report Queue.....	95
Delete Jobs from the Queue.....	96
Retry Transmission of a Patient Report.....	96
8: Work with the Patients List.....	98
Open the Patients List.....	100
Select a Patient from the Patients List.....	100
9: Maintenance.....	101
Adjust the Paper Tray for Paper Size.....	101
Store Thermal Paper.....	103
Clean the Printhead.....	104
Charge the Battery.....	104
Replace the Battery.....	105
10: Cleaning and Disinfection.....	108
Inspect the Device.....	108
Care at the Point of Use.....	108

Preparation for Cleaning.....	108
Clean and Disinfect Guidelines.....	108
Visual Inspection, Cleaning and Disinfection Frequency.....	109
Clean and Disinfect the Device and Trolley.....	110
Pre-Clean Inspection and Functional Test.....	110
Clean the Device and Trolley.....	110
Post-Clean Inspection.....	111
Disinfect the Device and Trolley.....	111
Clean and Disinfect Leadwires and Reusable Electrodes.....	112
Storage.....	112
Other Cleaning and Disinfection Agents.....	112
Additional Information.....	113

11: Troubleshooting..... 114

System Errors.....	114
ECG Acquisition Errors.....	115
Printing Errors.....	116
Report Transmission Errors.....	119
Wireless Network Connectivity Errors.....	120

A: Report Formats..... 123

ECG Report Formats.....	123
Rhythm Report Format.....	128
Full Disclosure (FD) Report Format.....	131

B: Patient Preparation..... 134

Prepare the Patient's Skin.....	134
Electrode Placement.....	135
Standard 12-Lead Electrode Placement.....	135

C: Patient Information Fields..... 137

Patient Information Text Box Names.....	137
---	-----

D: Technical Specifications..... 147

System Specifications.....	147
ECG Specifications.....	149
Environmental Specifications.....	150
Safety Specifications.....	151
Network Specifications.....	151

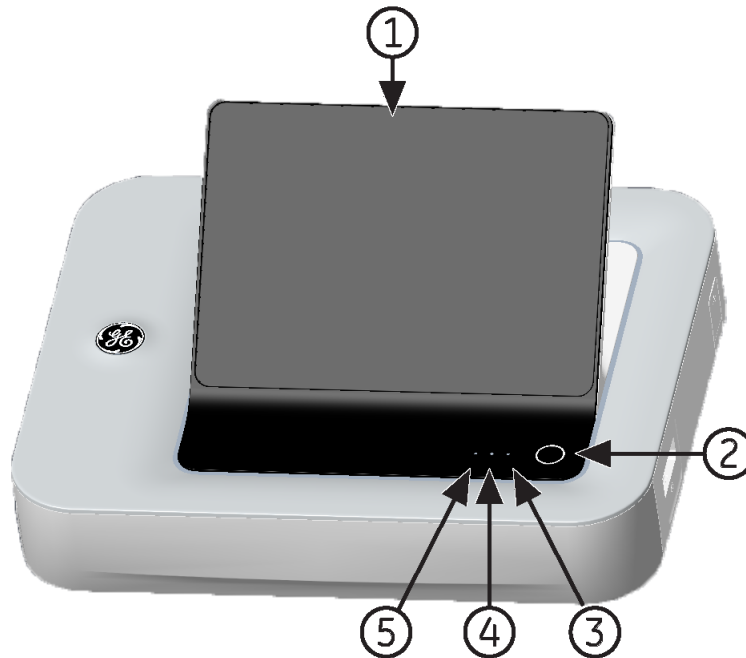
Glossary..... 153

1

Product Overview

The MAC 7 *Resting ECG Analysis System*, (referred to as "the device" throughout this document), supplies 12-lead ECG measurement and interpretative analysis, prints 12-leads of ECG, and transmits ECG data to and from a central ECG cardiovascular information system.

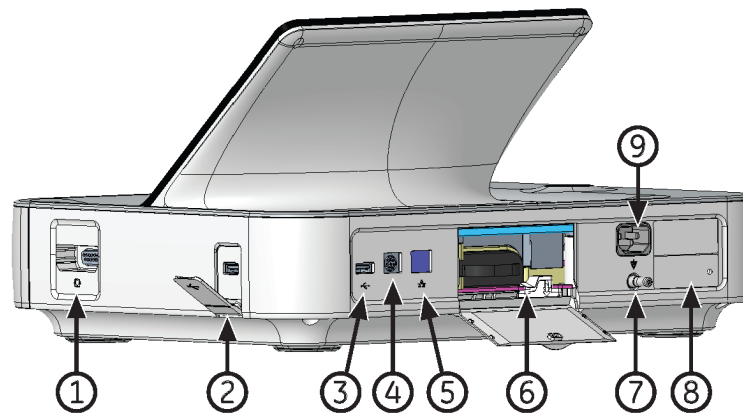
Front View



<i>Item</i>	<i>Name</i>	<i>Description</i>
1	Display and Touchscreen	Displays waveform and text data. The touchscreen enables you to interact directly with the device through touch gestures.
2	Power button	Turns the device on or off.

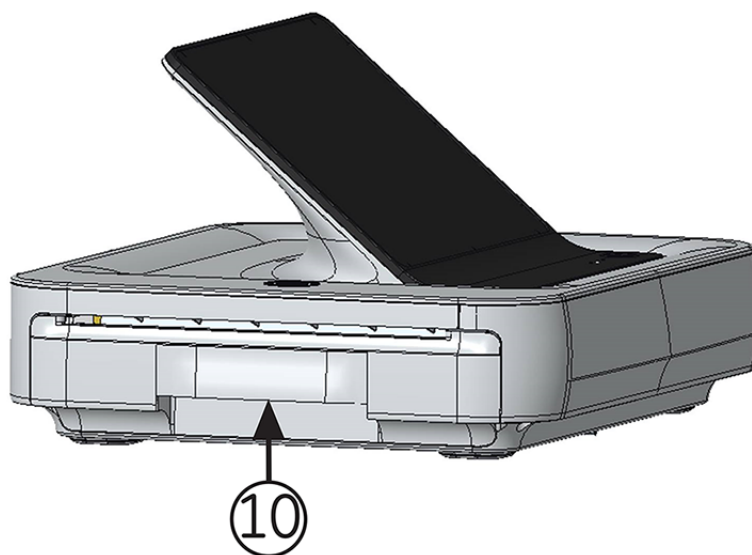
<i>Item</i>	<i>Name</i>	<i>Description</i>
3	Power on LED	Shows if the device is on or off. <ul style="list-style-type: none"> • Green light - on. • No light - off. • Flashing green light - standby mode.
4	Battery LED	Battery status: <ul style="list-style-type: none"> • Flashing amber light at two-second intervals - battery is charging. • Flashing amber light at a one-second interval - battery is critically low. • Flashing amber light at a half-second interval - battery has a communication failure. • No light - battery is fully charged, not installed, or discharging.
5	AC Power LED	AC power status: <ul style="list-style-type: none"> • Green light - the device is plugged in and receiving power. • No light - the device is not plugged into AC power.

Side and Rear View



<i>Item</i>	<i>Name</i>	<i>Description</i>
1	ECG Patient Cable Connector	D-sub 15-pin female connector for the acquisition cable.
2	USB Slot B	<ul style="list-style-type: none"> • Used to connect a USB flash drive or USB cable. You can connect a USB flash drive for a software update, backup/restore or export operations, or a barcode reader USB cable. • Standard USB connector for USB devices, for example, the external barcode reader, USB memory stick, USB keyboard and USB mouse.

<i>Item</i>	<i>Name</i>	<i>Description</i>
3	USB Slot A	<ul style="list-style-type: none"> Used to connect a USB flash drive or USB cable. You can connect a USB flash drive for a software update, backup/restore or export operations, or a barcode reader USB cable. Standard USB connector for USB devices, for example, the external barcode reader, USB memory stick, USB keyboard and USB mouse.
4	KISS Pump Connector	Used to connect a KISS pump cable.
5	Ethernet/LAN Port	Used to connect an Ethernet cable.
6	Battery Compartment	Used to insert the battery.
7	Equipotential Grounding Plug	Used to connect non-grounded peripheral devices.
8	Label	Product label.
9	AC Power Inlet	Used to connect the AC power cord.



<i>Item</i>	<i>Name</i>	<i>Description</i>
10	Printer Door	Used to pull out the paper tray.

Acquisition Screen Overview

The **Acquisition** screen is the main screen that displays when you first log on to the device. You can acquire an ECG from the Acquisition screen.

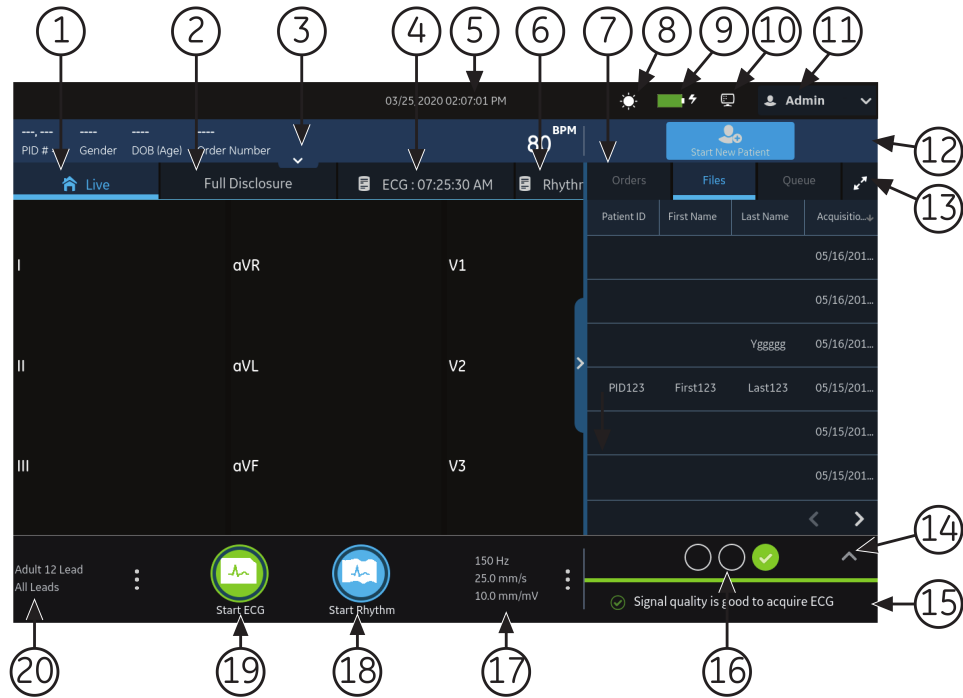


Table 1: Acquisition Screen

Item	Name	Description
1	Live tab	Displays the live waveform for the current patient connected to the device.
2	Full Disclosure tab	Displays a full disclosure ECG. NOTE: The Full Disclosure tab displays after you buy and enable the full disclosure function.
3	Patient Information Banner	Displays selected Patient Information such as the patient first name, surname, and gender. Select anywhere on the banner to add or edit patient information.
4	ECG tab	Displays the ECG recorded for a patient. The tab is titled ECG: <Time_of_Acquisition> . ECG previews and/or accepted ECGs are displayed on this tab.
5	Date and Time	Current local date and time in the configured date and time format. To configure a date and time format, refer to the <i>MAC 7 Resting ECG Analysis System Setup and Configuration Manual</i> .
6	Rhythm tab	Displays the rhythm recorded for a patient. The tab is titled Rhythm: <Time_of_Acquisition> .

<i>Item</i>	<i>Name</i>	<i>Description</i>
7	Orders/Patients, Files, and Queue tabs	<ul style="list-style-type: none"> The Orders tab displays when you enable order management. Select Orders to open the Orders list and view a list of the available orders. The Orders tab does not display if you disable order management, the Patients tab displays. Select Patients to open the Patients list. View a list of the last 500 patients display with ECGs that were acquired on the device. Select Files to open the Files list and view the list of stored patient reports. Select Queue to open the Queue list to view the list of reports in the queue to be transmit to a configured destination.
8	Brightness Icon	Select to adjust the screen brightness.
9	Battery or AC Power Icon	Displays the battery status.
10	Network Status Icon	Displays the wireless or LAN connection status.
11	User Menu	<p>Displays the name of the user logged on to the device. When you select the name, the user menu expands and displays the available menu options. You do not have access to some menu options. Your administrator can assign the proper privileges.</p> <p>If you disable user authentication or configure with Technician ID access, the Default user must to log on as a user with sufficient privileges to access a menu option.</p>
12	Start New Patient icon	Select to enter patient data for a new patient test.
13	Expand icon	Select the tab (Orders/Patients, Files, or Queue) that you want to expand, and select the Expand icon to open the list.
14	Electrode Placement Picture	<p>Select the arrow to expand and view the picture that shows the placement of electrodes and the electrode quality of each lead. Each lead quality indicator on the picture changes to yellow, red, or green, based on its connection status.</p> <p>You can enable or disable the auto-expansion of the picture. If auto-expansion of the picture is enabled:</p> <ul style="list-style-type: none"> The picture automatically expands if the Hookup Advisor Lead Quality Indicator is yellow or red. The picture automatically collapses if the Hookup Advisor Lead Quality Indicator is consistently green for a few seconds.

<i>Item</i>	<i>Name</i>	<i>Description</i>
15	Notification Area	<p>Displays messages:</p> <ul style="list-style-type: none"> • printing status and progress • report transmission status • Hookup Advisor lead quality status <p>The messages display one at a time in the sequence of occurrence. The messages do not display when a patient is connected and hookup advisor is evaluating the waveform.</p>
16	Hookup Advisor Lead Quality Status Indicator	Displays the lead quality status indicator in three circles that change to yellow, red, or green, based on the lead quality.
17	Filter, Speed and Gain	<p>Displays the default waveform filter, speed, and gain. Select anywhere around the ellipsis icon and select a different value. You can only make a change before you record an ECG. You can make a change before and during the recording of a rhythm.</p> <p>NOTE: A change to the filter, speed or gain is applicable to the current patient. For a new patient, the values are reset to default settings.</p>
18	Start Rhythm icon	Select to print or digitally record the rhythm report.
19	Start ECG icon	Select to record an ECG.
20	Lead Set and Display Format	<p>Displays the default test type and display format. Select anywhere around the ellipsis icon and select a different value. You can only make a change before you record an ECG. You can make a change before and during the recording of a rhythm.</p> <p>NOTE: Any change to the test type and display format only applies to the current patient. For a new patient, the values are reset to the default settings.</p>

User Menu Options Description

The **User Menu** is located at the top right corner of the Acquisition screen.

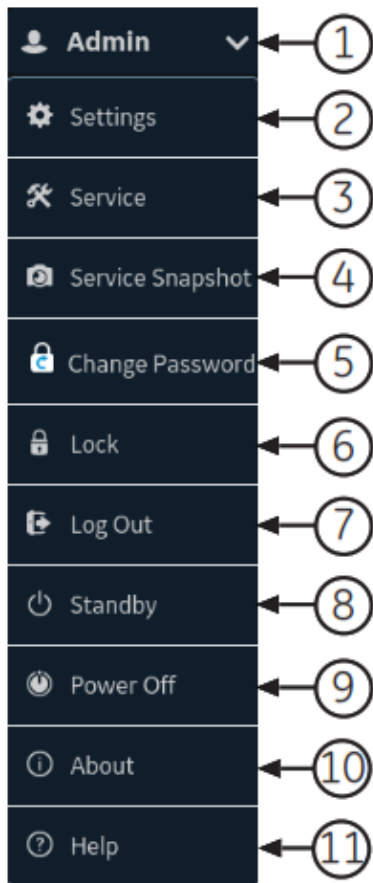


Table 2: User Menu Options

Item	Option	Description
1	<User>	Displays the name of the user logged into the device as configured by your administrator. Pre-defined users display as follows: <ul style="list-style-type: none"> • Admin • STAT • Service • Default
2	Settings	Displays the Settings screen used to configure the device. The administrator must grant you privileges to access this screen. If the user does not have access to the screen and if user authentication is disabled or configured with Technician ID access, the Default user is prompted to log on as a user with sufficient privileges.
3	Service	Displays the Service screen used to service the device. Your administrator must grant you privileges to access this screen. If the user does not have access to the screen and if user authentication is disabled or configured with Technician ID access, the Default user is prompted to log on as a user with sufficient privileges.




<i>Item</i>	<i>Option</i>	<i>Description</i>
4	Service Snapshot	The user can get a service snapshot without the Service privileges. Complete the snapshot to help identify a problem on the device.
5	Change Password	The Admin user or a local user can change their password. Displays only if you enable full user authentication.
6	Lock	Locks the device. Displays only if you enable full user authentication.
7	Log Out	Logs off the user. Displays only when you are logged on to the device.
8	Standby	Puts the device in standby mode to save battery power without turning it off.
9	Power Off	Powers off the device. NOTE: Pressing the Power button on the front panel can also stop the device.
10	About	Displays the device software information.
11	Help	Displays help information about the device.



Battery Status

The battery icon shows the stored power of the battery. The power levels are shown in 10% increments. The color of the icons change to show the level of battery life.

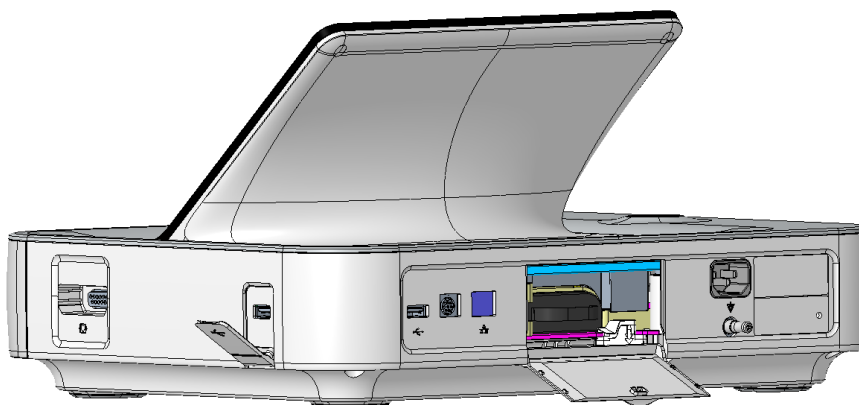
You can operate the device connected to the AC Mains power when the batteries are removed. The device can also operate with a single battery installed to allow hot swapping of the battery without plugging into AC Power.

Table 3: Examples of Battery and Power Icon Status

<i>Icon</i>	<i>Status</i>	<i>Description</i>
Green 	Connected to AC Mains	The device is connected to the AC Mains power and the battery is charging.
White 	Operating on Battery	The device is only using the battery and the battery is discharging. The device is not connected to the AC Mains power.
White 	Battery – Fully Charged and Disconnected from AC Mains	The battery is fully charged and the device is disconnected from the AC Mains power. When the device is connected to the AC Mains power and the battery icon is solid green, shows that the battery is fully charged.

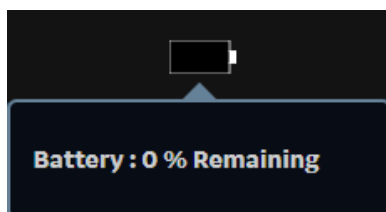
<i>Icon</i>	<i>Status</i>	<i>Description</i>
Red 	Battery - Low or Critically Low	The battery is at low capacity and the device is disconnected from the AC Mains power. If the charge level is below 15%, an error tone sounds. If the charge level is below 10%, the error tone is louder, longer, and sounds every minute. A message opens that tells you the battery is critically low and you should connect to AC power immediately.
No color with red X 	Battery Not Present, AC Mains Power	The battery is not in the device and the AC Mains power is connected. If you select the battery icon, a message opens that tells you the battery is not present.

The image illustrates the battery in the battery compartment:



Show Battery Status

1. Select the battery icon on the **Status Bar** of the Acquisition screen.
2. An image opens showing the battery life.



Show Network Connection Status

When the wireless and wired connection is set to **Enable**, the device uses a wired connection when you connect a Local Area Network (LAN) cable. If you remove the LAN cable, the device uses the wireless connection.

To view the status of your device's connection to your LAN or Wireless Local Area Network (WLAN), perform the procedure as follows:

1. Select the **Network Status** icon on the status bar.
2. Review the tables for the description of the network status icon when connected to a LAN or WLAN network.

Table 4: LAN Icons







<i>Network Status Icon</i>	<i>Status</i>	<i>Description</i>
	LAN Active	The device is connected to a LAN.
	LAN Connected	The device is connected to a remote server through a LAN and is in the process of obtaining an IP address. If this icon is blinking, the device is acquiring an IP address from DHCP.
	LAN Disconnected	The device is not connected to a LAN; no LAN (Ethernet) cable is attached to the device.

Table 5: WLAN Icons

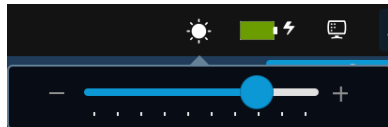
<i>Icon</i>	<i>Status</i>	<i>Description</i>
	WLAN Active	The device is connected to a WLAN and has a valid IP address. The icon shows a number of wireless bars to indicate the strength of the wireless signal.
	WLAN Connected	The device is connected to an access point and is in the process of obtaining an IP address. If this icon is blinking, the device is acquiring an IP address from DHCP.
	WLAN Disconnected	The device is not connected to a WLAN.

For more information about wireless certificate errors, see [Wireless Network Connectivity Errors on page 120](#).

3. Close the **Network Status** window by selecting something on the screen outside of the window.

Change the Brightness of the Screen

To change the brightness of the screen, select the brightness icon on the **Status Bar** of the Acquisition screen.



Follow one of the steps to change the brightness level of the screen from 10% to 100%:

- To increase the brightness of the screen, press +.
- To decrease the brightness of the screen, press -.

The changes you make are automatically saved to your device and will not change when you turn the device on or off.

2

Login and Security

Power On the ECG Device

1. Press the **Power** button on the keyboard for a few seconds to start the device.
The device is powered on. The **Power on** LED on the front panel is green.
A notification message displays, if it is configured by the administrator.
2. Click **Accept**.
 - If user authentication is enabled, you are prompted to log on to the device.
 - If user authentication is disabled, you are automatically logged on to the device as the **Default User**.
 - If the user authentication mode is **Technician ID**, enter the **Technician ID** to log on as a **Default User**.

Power Off the ECG Device


1. Before you **Power Off** the device, complete pending tasks, for example, acquire an ECG and save configuration settings.
2. Do one of these steps to remove power from the ECG device:
 - a) From the **User Menu** on the screen, select **Power Off**.
The **Power off** window opens and displays a message. Select **Power Off**.
The device is off. The **Power on** LED on the front panel is off.
 - b) Press the **Power** button on the front panel for a few seconds:
The **Power Options** window opens with **Cancel**, **Standby**, **Log Out**, **Privacy Mode**, and **Power Off** options. Select **Power Off**.


The device is off. The **Power on** LED on the front panel is off.

User Authentication

The device supports different modes of user authentication.

Table 6: Supported User Authentication Modes

User Authentication Mode	Description
Full authentication with STAT login	<p>The Login screen displays with these fields when the device is powered on or unlocked.</p>  <p>The users below can log on to the device:</p> <ul style="list-style-type: none"> • Pre-defined users (Admin, Service) • LDAP users (If LDAP-based user authentication is configured) • Local users (If user profiles are locally managed on the device) • STAT User if STAT button is selected. The user can configure the text for this button.

User Authentication Mode	Description
Technician ID login	<p>The Login screen displays when the device is powered on or unlocked.</p>  <p>A technician can access the device by entering the Technician ID.</p>
No authentication	<p>A Login screen does not display when you power on the device. You are automatically logged on as the Default User. The Default User cannot access the device if user authentication is enabled.</p>

Log On to the Device

Enter the user name and password on the **Login** screen to enable User authentication to allow users to log on to the device.

Table 7: Type of Users

Type of User	Description
Admin user	<p>The username is Admin. The default password to log on as the Admin user is admin123. The Admin user is prompted to change the default password immediately after the first login.</p>
Service user	<p>The username is Service. This username is intended for use by Service personnel. A user with the user management privilege can set the password for the Service user.</p>
Local users	<p>The local user profiles are managed by the device administrator. Obtain your username and password from the device administrator.</p>
LDAP users	<p>LDAP user authentication is available only if you configure the device to support LDAP. The LDAP server administrator manages the LDAP user profiles. Obtain your username and password from the LDAP server administrator. Your privileges are based on the user role assigned to the LDAP group to which your user profile belongs.</p>

- Do one of these steps:
 - If the device is shutdown, power on the device. See [Power On the ECG Device on page 18](#).
 - If the device is locked, unlock the device. See [Unlock the Device on page 24](#).

The **Login** screen displays.

2. Enter your username and password.
 - If you are an LDAP user and the default domain name is not configured, or your user profile is part of an LDAP server domain which is not the default domain, enter the domain name and username. For example, Domain \Username.
 - To verify that you entered the correct password, select **Show** to view the password.
 - Contact your administrator to reset your password. Log on to the device using the new password. Change the password immediately for security reasons.
 - If you are the Admin user and forgot your password, perform a system reset to reset the password to the default password **admin123**. For more information, see [Perform System Reset on page 25](#).
3. Select **Log In**.
 - If the login credentials are correct, you are successfully logged on to the device. Your username displays on the upper-right corner of all of the screens you have access.
 - If your login fails, see the table below:

Table 8: Login Errors

<i>Symptom</i>	<i>Cause</i>	<i>Solution</i>
The username or password is incorrect.	You entered your username or password incorrectly.	Re-enter your correct username and password again.
	You are a local user and you forgot your password	Contact your administrator to reset your password, then log on to the device again.
	If you are an LDAP user, the error is caused by: <ul style="list-style-type: none"> • No connection to the LDAP server. Your username cannot be authenticated against cached LDAP user credentials. • You do not belong to any groups authorized access to this device. 	<ul style="list-style-type: none"> • Wait for the connection to the LDAP server to be restored and log on to the device again. • Contact your LDAP administrator to assign your user profile to an LDAP group authorized for this device and log on to the device again.
	<ul style="list-style-type: none"> • Your current password has expired. 	<ul style="list-style-type: none"> • Contact your LDAP administrator to change your password.

<i>Symptom</i>	<i>Cause</i>	<i>Solution</i>
You are prompted to change your password.	You are a local or Admin user and your password has expired.	Perform the procedure Change the User Password on page 23 and log on to the device again.

Log On the Device as a STAT User

If you enable user authentication **STAT**, a **STAT** user can log on to the device to get a patient ECG in an emergency.

1. On the **Login** screen, select **STAT**.
The Acquisition screen opens.
2. You can get an ECG or other tasks the administrator has given to the **STAT** user role. You are not able to review any report generated by other users.

Access the Device using a Technician ID

Make sure that you enable the user authentication.

1. On the **Login** screen, enter a valid Technician ID to populate the **Technician ID** field.
2. Select **Continue**.
You are logged on as the **Default User**. The Acquisition screen displays. You can perform tasks with **Default User** or **Technician ID** assigned privileges.

Log Out of the Device

Log out of your user session when you are done using the device. You must enable User authentication.

1. Complete pending tasks, for example, acquire an ECG or save configuration settings, before you log off from your user session.
2. Perform one of these steps to log off of the device:
 - Press the **Power** button. The **Power Options** dialog box opens. Select **Log Out**.
 - From the User Menu on the Acquisition screen, select **Log Out** to log off the device.

If you log off before a task is completed, a message displays that you will lose incomplete data.

3. Perform one of these steps:
 - If you have unsaved data, select **Cancel**.
 - If you want to log off, select **Log Out**.

You are logged off your user session.

Change the User Password

This procedure applies only to the Admin user and local users. LDAP users must change their password externally as per the instructions provided by their LDAP administrator.

Make sure that the new password follows the password rules:

Password must contain at least:

- One lowercase letter
- One uppercase letter
- One number
- One special character

1. From the User Menu on the Acquisition screen, select **Change Password**.
The **Change Password** dialog box opens.
2. Enter the current password and new password, and confirm the new password.
3. Select **Change Password**.
 - If the new password meets the password requirements, a message displays that your password was changed successfully.
Select **OK** to close the **Change Password** window. You are logged into the device.
 - If the new password does not meet the password requirements, an error message displays.
Follow the password rules for a new password and repeat the steps in this procedure to create a new password.

Activate or Deactivate Privacy Mode

Privacy mode can be activated to prevent the display of confidential information on the screen. During this mode, the screen will be blank. Processes such as ECG acquisition, transmission, and printing continue to work in background, but the device ignores input from a barcode reader.

- To activate privacy mode, press the **Power** button on the front panel for a few seconds:

The **Power Options** window opens with **Power Off**, **Privacy Mode**, **Log Out**, and **Standby** options. Select **Privacy Mode**.

The GE logo displays on the center of the screen with a black background, and a message displays indicating screen privacy is turned on.

- To deactivate privacy mode, tap anywhere on the screen.

The screen you were working on before activating privacy mode displays.

Lock the Device

You can lock the device if you enable user authentication. You cannot lock the device while ECG or rhythm acquisition or report printing is in progress.

NOTE:

The **STAT User** cannot lock the device.

1. Complete your tasks.
2. From the User Menu on the Acquisition screen, select **Lock**.

The device is locked. Your username displays on the lock screen.

Unlock the Device

1. Tap the lock icon  on the screen.

A message displays prior to login if one is configured by your administrator. Click **Accept**.

The **Login** screen displays. The **User Name** field displays the name of the user who is logged on.

2. Enter your password and select **Log In** to log on to the device.

You can also log in as:

- A **STAT User** (if STAT access is enabled)
- A different user

A message displays that the current user will be logged out and any unsaved data will be lost. Select **Continue** to log into the device.

Put the Device on Standby

Perform one of the steps below to put the device on standby:

- From the User Menu on the Acquisition screen, select **Standby**.
- Press the **Power** button .

The **Power Options** dialog opens. Select **Standby**.

To exit standby mode, press the **Power** button :

- If user authentication is configured, standby mode is off and the lock screen displays. Perform the procedure [Unlock the Device on page 24](#) to unlock and log in to the device.
- If user authentication is not configured, you return to the last screen displayed when the device was put on standby mode.

Perform System Reset

Before you start this procedure, make sure that:

- You have the serial number of the device.
- You connect the device to AC Power.
- If the authentication mode of the device is **No authentication**, access the **Settings** screen from the user menu to open the **Login** screen.
- If the authentication mode of the device is **Full Authentication with Stat**, power on the device to view the **Login** screen.
- You must log on to the device as the Admin user.

NOTE:

The **System Reset** deletes all data and settings. The system is reset to factory defaults. Use the default admin password to log on to the device. It keeps the previously enabled option codes, serial number, MAC address, and Wireless Country of Operation configuration.

NOTE:

The **Restore to Factory Defaults** resets the settings or section of settings.

Use this procedure as a last solution. **Transfer your data from the system before you start the procedure.**

1. When the **Login** screen displays, press $\uparrow \downarrow \leftarrow \rightarrow \uparrow \downarrow \leftarrow \rightarrow$, consecutively, on the soft keyboard.

The **System Restore** screen displays a warning that the System Restore will return your system to the original factory shipped configuration. All patient data, system setup changes, logs, and user data will be lost and unrecoverable.

2. Enter the serial number of the device in the **Enter the system serial number** field. The **Restore** button enables after you enter the correct serial number.
3. Select **Restore** to proceed with system restore.

The system configuration is reset to factory defaults and all patient data records are deleted. The device reboots. You can access the device as the **Default** user without login credentials.

4. To reconfigure the device, access the **Settings** screen from the user menu. A login screen opens. Log on as **Admin** user with the default password *admin123*.

3

Patient Information

Patient Information Screen Overview

Patient information helps you to identify the patient. View and make sure the patient information is complete and correct before you start an ECG.

You can update the patient information on the **Patient Information** screen as follows:

- Attach an order from the orders list (if order management is enabled).
- Attach patient information from the recent patients list (if order management is disabled).
- Read a patient barcode with a barcode scanner.
- Use a software keyboard to enter **Patient Information**.
- Do an Admission, Discharge, Transfer (ADT) query.

WARNING:

INACCURATE PATIENT DATA

Patient data from the last patient may remain in the patient information banner if the last user did not finish and close out of their session. Incorrect patient data can affect diagnosis and treatment. Make sure to check the patient information screen for each patient. Make sure that you enter patient data for the correct patient.

On the Acquisition screen, the **Patient Information** banner above the waveform and shows minimum information about the patient. The text boxes shown in the bar are configurable.

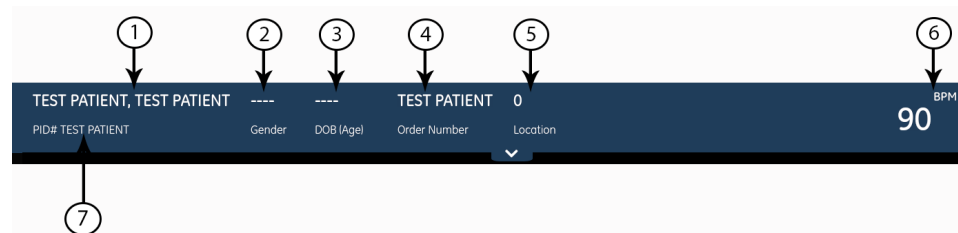



Table 9: Patient Information Banner

Item	Field	Description
1	Name	Shows the last name and first name of the patient.
2	Gender	Shows the patient gender.
3	DOB (Age)	Shows the patient date of birth and age. If the Date of Birth field is configured to be hidden on the Patient Information screen, only Age Shows on the bar.
4	Order Number	Shows the order number attached to the patient test, if an order is attached.
5	Location	Shows the location where the ECG is being taken. For each patient test, the location is filled in from the Location ID configured in the System Settings.
6	BPM	Shows the real-time beats per minute (BPM). The heart rate updates whenever the heart rate calculation algorithm reports a change in the heart rate. The heart rate does not display if it drops below 30 bpm, increases above 300 bpm, or the system is not getting ECG data. In cases where the heart rate does not display, three asterisk symbols show instead of the heart rate. 
7	PID#	Shows the unique identification number of the patient (patient ID).

Select the **Patient Information** banner to expand it into a full screen view. Fields configured by your administrator display in the **Patient Information** screen.

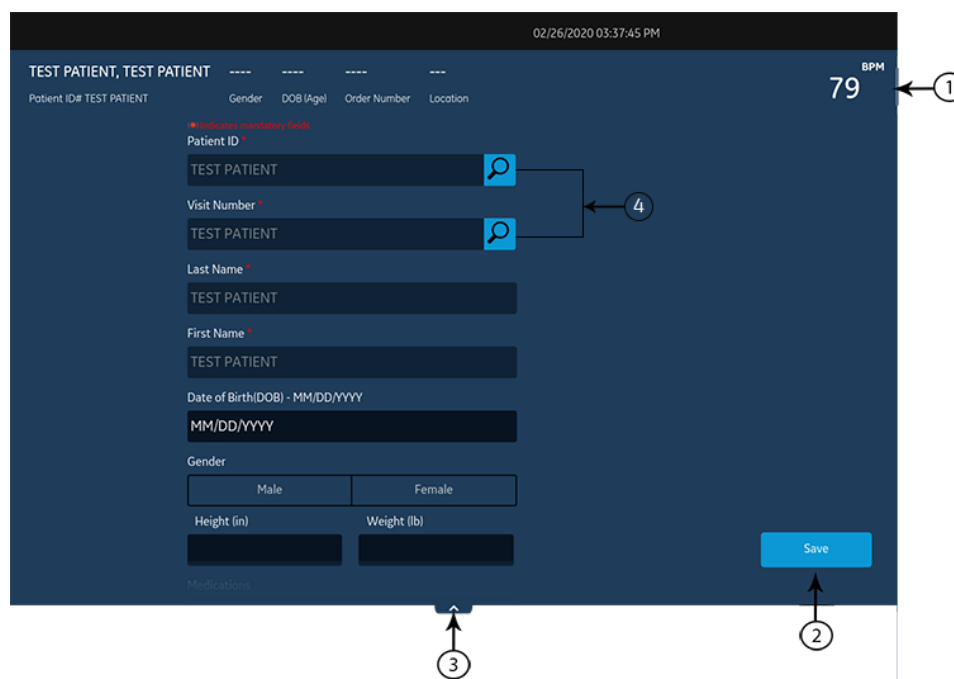



Table 10: Patient Information Screen

Item	Field	Description
1	Patient Information banner	Shows patient information, such as patient first name, last name, gender, age, and other configured information.
2	Save button	Select Save to save the patient information.
3	Collapse button	Select the Collapse button or select a spot on the Patient Information screen to collapse and show only the bar. Collapsing the screen saves the entered information.
4	Search icon	Use the software keyboard to enter the Patient ID or Visit Number on the screen and press Search icon  on the respective field.

Swipe your finger in the upward or downward direction on the screen to scroll through the screen. For information on updating data in the **Patient Information** screen, see [Enter Patient Information on page 29](#).

Start a Test for a New Patient

Start a test for a new patient in the Acquisition screen.

1. Select the **Start New Patient** icon located in the upper right corner of the Acquisition screen:



<i>If</i>	<i>Then</i>
A patient test is open with unsaved data, a message opens that unsaved patient data will be lost.	Select one: <ul style="list-style-type: none"> • Select Start New Patient, all unsaved patient data is deleted and you can enter new patient data. • Select Continue with Same Patient, the patient information on the screen is used for you to continue with the same patient.
Electrodes are put on a patient and then removed or disconnected for more than 30 seconds, a warning message displays when the electrodes are put on a patient again.	Select one: <ul style="list-style-type: none"> • Yes, Continue if you put electrodes on the same patient, then the device will continue a test for that patient. • No, Clear patient info if you put electrodes on a new patient, then the device will start a test for the new patient.

2. If there are pending print tasks in the queue, a message opens that pending print tasks will be deleted from the queue.

- Select **Continue** to delete pending print tasks and start the test for the new patient. The **Patient Information** screen expands.
 - Select **Cancel** to cancel the test for the new patient, and complete the pending print tasks.
3. The **Patient Information** screen opens, enter information for the patient.

Enter Patient Information

Use the methods below to enter or update patient data in the **Patient Information** screen:

- Use a barcode reader, see [Update Patient Information with a Barcode Reader on page 29](#).
- Do ADT queries, see [Query Orders or ADT for Patient Demographics on page 30](#).
- Open a patient record in the **Patients** list, see [Select a Patient from the Patients List on page 100](#).
- Attach an order, see [Work with Orders on page 68](#).
- Use a software keyboard, see [Enter or Edit Patient Information Using the Software Keyboard on page 36](#).

Update Patient Information with a Barcode Reader

Using a barcode reader can simplify the entry of patient information and reduce the chance of introducing errors. When you scan a patient's barcode, it retrieves the patient information encoded in the barcode. You can then verify and modify the information.

You can scan a patient's barcode using an external barcode reader.

Before you use an external barcode reader, make sure that:

- The BRCD option to use an external barcode reader is activated on the device.
- The barcode reader is connected to the device, and the device is correctly configured to use the peripheral. For more information, see the *MAC™ 7 Resting ECG Analysis System Setup and Configuration Manual*.
- You are in the **Live** or **Full Disclosure** ECG screen, or when patient demographics banner is open.

Before you use the barcode reader, make sure that you are in the **Live** or **Full Disclosure** tab (starting a new patient test) or ECG Preview tab.

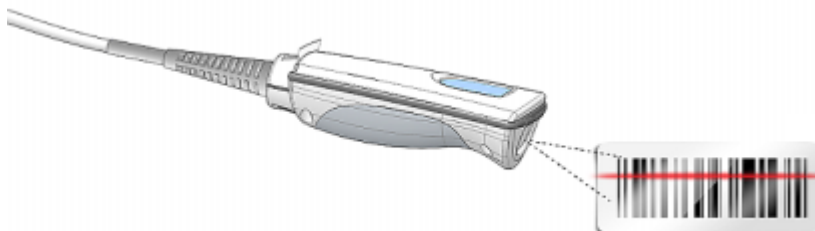
An error message displays if you scan a barcode during the acquisition of a Resting ECG, Rhythm ECG or a Full Disclosure ECG for the patient.

Use the procedure below to scan the patient's barcode:

1. Start a test for a new patient. For more information, see [Start a Test for a New Patient on page 28](#).
2. Scan the patient's barcode to populate the **Patient Information** screen.

Hold the button and position the barcode reader 10 cm to 15 cm (4 inches to 6 inches) above the barcode to be scanned.

The barcode is automatically scanned.




The barcode reader emits a sound to confirm the barcode scan. The **Patient Information** screen expands and displays the fields populated with patient information.

3. If there is a mismatch between the data scanned from the barcode and existing patient information, a message displays. Perform one of the steps as follows:
 - Select **Use Scanned Data** to populate the barcode data into the relevant fields on the **Patient Information** screen, and confirm the data entered from the barcode is accurate.
 - Select **Use Current Data** to retain the manually entered information on the **Patient Information** screen, and enter or modify patient information as necessary.

Query Orders or ADT for Patient Demographics

Make sure that:

- You have privileges to see orders and do remote patient query.
 - Use orders of ADT data as configured on the device to do remote patient query.
 - A barcode reader is connected to the device.
1. Start a test for a new patient. For more information, see [Start a Test for a New Patient on page 28](#).
 2. Do one of the steps below:
 - Scan the patient barcode.
 - Use the keyboard to enter the **Patient ID** or **Visit Number** on the screen and press **Search** icon  on the respective field.

The device queries

- orders only
- or orders and then ADT data
- or ADT data only

depending on how the administrator configured the device. Go to:

- [Order Query Workflow on page 31](#) if your device queries orders only.
- [Orders and then ADT Query Workflow on page 33](#) if your device queries orders and then ADT data.
- [ADT Query Workflow on page 35](#) if your device queries ADT data only or if no matching order is found.

3. Enter or change patient information, as necessary.

Order Query Workflow

The device first searches for local orders with the **Patient ID**.

<i>If</i>	<i>Then</i>
Multiple local orders are found on the device	The orders show on the Orders tab in a filtered list. Select the order you will to attach to the patient test.
One local order is found on the device	The order fills in the Patient Information screen, if there is no mismatch with the patient data on the screen.
No local orders are found on the device	A message displays in the notification area that no matching local orders are found.

The device first searches for local orders with the **Visit Number**.

<i>If</i>	<i>Then</i>
Multiple local orders are found on the device	The orders show on the Orders tab in a filtered list. Select the order you will to attach to the patient test.
One local order is found on the device	The order fills in the Patient Information screen, if there is no mismatch with the patient data on the screen.
No local orders are found on the device	A message displays in the notification area that no matching local orders are found.

The device then searches for remote orders in the MUSE system with **Patient ID**.

<i>If</i>	<i>Then</i>
Multiple remote orders are found on the MUSE system	The orders show on the Orders tab in a filtered list. Select the order you will to attach to the patient test.
One remote order is found on the MUSE system	The order fills in the Patient Information screen, if there is no mismatch with the patient data on the screen.
No remote orders are found on the MUSE system	A message displays in the notification area that no matching remote orders are found.

<i>If</i>	<i>Then</i>
Remote order query failed on the MUSE system	A message displays in the notification area that remote order query has failed.

The device then searches for ADT data in the MUSE system with **Visit Number**.

<i>If</i>	<i>Then</i>
Multiple ADT records are found on the MUSE system	<p>The matching records show on the Acquisition screen, and a message displays in the notification area that matching ADT data is found.</p> <p>The maximum of five records display on the Acquisition screen.</p> <p>Select the ADT record to search the order using that selected record's Patient ID.</p>
Only one ADT record is found on the MUSE system	<p>System searches for the Patient ID order found in that ADT record.</p> <ul style="list-style-type: none"> • If multiple orders are found on the system - The orders show on the Orders tab in a filtered list. Select the order you will to attach to the patient test. • If only one order is found on the system - The order fills in the Patient Information screen, if there is no mismatch with the patient data on the screen. • If no orders are found on the system - A message displays in the notification area that no matching remote orders are found. • If remote order query is failed on the system - A message displays in the notification area that remote order query has failed.
No ADT records are found on the MUSE system	A message displays in the notification area that no ADT data found.
Remote ADT data query failed on the MUSE system	A message displays in the notification area that ADT query has failed.

When local or remote orders are found, and you try to attach the order:

<i>If</i>	<i>Then</i>
The selected order matches the patient demographics in the Patient Information screen	<p>A warning message displays on the screen:</p> <p><i>Are you sure you want to attach this order to the current test?</i></p> <p>Select Yes to attach the order, No to cancel the action.</p>

<i>If</i>	<i>Then</i>
The selected order does not match the patient demographics in the Patient Information screen	A warning message displays on the screen: <i>*Name or Patient ID Mismatch*</i> <i>Are you sure you want to attach this order to the current test?</i> Select Yes to attach the order, No to cancel the action.

Orders and then ADT Query Workflow

The device first searches for local orders with the **Patient ID**.

<i>If</i>	<i>Then</i>
Multiple local orders are found on the device	The orders show on the Orders tab in a filtered list. Select the order you will to attach to the patient test.
One local order is found on the device	The order fills in the Patient Information screen, if there is no mismatch with the patient data on the screen.
No local orders are found on the device	A message displays in the notification area that no matching local orders are found.

The device first searches for local orders with the **Visit Number**.

<i>If</i>	<i>Then</i>
Multiple local orders are found on the device	The orders show on the Orders tab in a filtered list. Select the order you will to attach to the patient test.
One local order is found on the device	The order fills in the Patient Information screen, if there is no mismatch with the patient data on the screen.
No local orders are found on the device	A message displays in the notification area that no matching local orders are found.

The device then searches for remote orders in the MUSE system with **Patient ID**.

<i>If</i>	<i>Then</i>
Multiple remote orders are found on the MUSE system	The orders show on the Orders tab in a filtered list. Select the order you will to attach to the patient test.
One remote order is found on the MUSE system	The order fills in the Patient Information screen, if there is no mismatch with the patient data on the screen.

<i>If</i>	<i>Then</i>
No remote orders are found on the MUSE system	<p>A message displays in the notification area that no matching remote orders are found. The device then searches for ADT data in the MUSE system.</p> <ul style="list-style-type: none"> • If multiple ADT records are found on the MUSE system - The matching records show on the Acquisition screen, and a message displays in the notification area that matching ADT data is found. Select the ADT record to search the order using that selected record's Patient ID. • If only one ADT record is found on the MUSE system - The device searches for the Patient ID order found in that ADT record. <ul style="list-style-type: none"> • If multiple orders are found on the system - The orders show on the Orders tab in a filtered list. Select the order you will to attach to the patient test. • If only one order is found on the system - The order fills in the Patient Information screen, if there is no mismatch with the patient data on the screen. • If no orders are found on the system - A message displays in the notification area that no matching remote orders are found. • If remote order query is failed on the system - A message displays in the notification area that remote order query has failed. • If no ADT records are found on the MUSE system - A message displays in the notification area that no ADT data/remote orders found. • If remote ADT data query failed on the MUSE system - A message opens in the notification area that ADT query has failed.
Remote order query failed on the MUSE system	A message displays in the notification area that remote order query has failed.

The device then searches for ADT data in the MUSE system with **Visit Number**.

<i>If</i>	<i>Then</i>
Multiple ADT records are found on the MUSE system	<p>The matching records show on the Acquisition screen, and a message displays in the notification area that matching ADT data is found.</p> <p>The maximum of five records display on the Acquisition screen.</p> <p>Select the ADT record to search the order using that selected record's Patient ID.</p>

<i>If</i>	<i>Then</i>
Only one ADT record is found on the MUSE system	System searches for the Patient ID order found in that ADT record. <ul style="list-style-type: none"> • If multiple orders are found on the system - The orders show on the Orders tab in a filtered list. Select the order you will to attach to the patient test. • If only one order is found on the system - The order fills in the Patient Information screen, if there is no mismatch with the patient data on the screen. • If no orders are found on the system - A message displays in the notification area that no matching remote orders are found. • If remote order query is failed on the system - A message displays in the notification area that remote order query has failed.
No ADT records are found on the MUSE system	A message displays in the notification area that no ADT data/remote orders found.
Remote ADT data query failed on the MUSE system	A message displays in the notification area that ADT query has failed.

When local or remote orders are found, and you try to attach the order:

<i>If</i>	<i>Then</i>
The selected order matches the patient demographics in the Patient Information screen	A warning message displays on the screen: <i>Are you sure you want to attach this order to the current test?</i> Select Yes to attach the order, No to cancel the action.
The selected order does not match the patient demographics in the Patient Information screen	A warning message displays on the screen: <i>Are you sure you want to attach this order to the current test?</i> Select Yes to attach the order, No to cancel the action.

ADT Query Workflow

The device searches for ADT data in the MUSE system with the **Patient ID** or **Visit Number**.

<i>If</i>	<i>Then</i>
An ADT record that matches the Patient ID or Visit Number is found on the MUSE system	The patient demographics fills in on the Patient Information screen.

<i>If</i>	<i>Then</i>
Multiple ADT records that match the Patient ID or Visit Number are found on the MUSE system	The matching records show on the Acquisition screen, and a message opens in the notification area that matching ADT data is found. Select a ADT record, and click Select to fill in the patient demographics on the Patient Information screen.
No ADT records that match the Patient ID or Visit Number are found on the MUSE system	A message opens in the notification area that no matching ADT data is found.
The ADT query failed	A message opens in the notification area that ADT query has failed.

NOTE:

If multiple sites are configured on a MUSE system, ADT query is done only on Site 1, if the MUSE system version is MUSE v9 SP5 or earlier. ADT query to the MUSE system for sites other than Site 1 requires MUSE v9 SP6 or later.

Enter or Edit Patient Information Using the Software Keyboard

Below is the software keyboard information:



<i>Item</i>	<i>Name</i>	<i>Description</i>
1	Backspace Key	Deletes inputs.
2	Enter Key	Enters inputs.
3	Save Key	Saves inputs.
4	Minimize Key	Minimizes the keypad from the screen.
5	Arrow Keys	Provides movement between columns.
6	Space Key	Adds a space between entered characters.
7	Number Key	Switches to numbers and symbols.

<i>Item</i>	<i>Name</i>	<i>Description</i>
8	Input Method	Switches between different input methods. NOTE: If you use an English user interface, you cannot switch the input methods from English to Chinese Pinyin. If you use the Chinese user interface, you can switch the input methods freely between English and Chinese Pinyin.
9	Capitalization Key	Capitalizes a letter during entering.

1. Enter data in the fields displayed in the **Patient Information** screen using the software keyboard. Only fields that are configured to be displayed in the **Patient Information** screen display. See [Patient Information Text Box Names on page 137](#) for a list of fields that can display on the screen.

- If the Pinyin input method is configured, when you enter data in the fields, a number list of matching Chinese characters displays in a drop-down menu. Select or enter the number of the desired value in the list to populate the Chinese character in the field.
- If you enter incorrect data in a field, the field border changes to red.
- An asterisk (*) displays adjacent to mandatory fields in the **Patient Information**.

NOTE:

If you go to the **Settings** or **Service** screen before you complete a patient test, the data entered in the **Patient Information** screen clears when you go back to the **Acquisition** screen.

2. To save your entries, select **Save**.

The information is saved and the **Patient Information** screen closes.

Based on the **Mandatory fields apply for Transmission** or **Acquisition** settings, the ECG report will not be accepted, transmitted, or printed until you enter the patient demographic data for any of the mandatory fields. You need to complete the data for the mandatory fields.

4

Record an ECG or Rhythm

Hookup Advisor Overview

The **Hookup Advisor** is a tool to monitor the lead signal quality during ECG acquisition. It can decrease or eliminate the occurrence of poor quality ECGs, by allowing you to view each leadwire signal quality and adjust as necessary.

The **Hookup Advisor** reports the status based on signals from each leadwire. Connect the RA/R leadwire, and then another leadwire to the patient, an electrode placement image expands in the **Hookup Advisor** panel. If all leadwires are disconnected from the patient, the electrode placement image collapses after a few seconds.

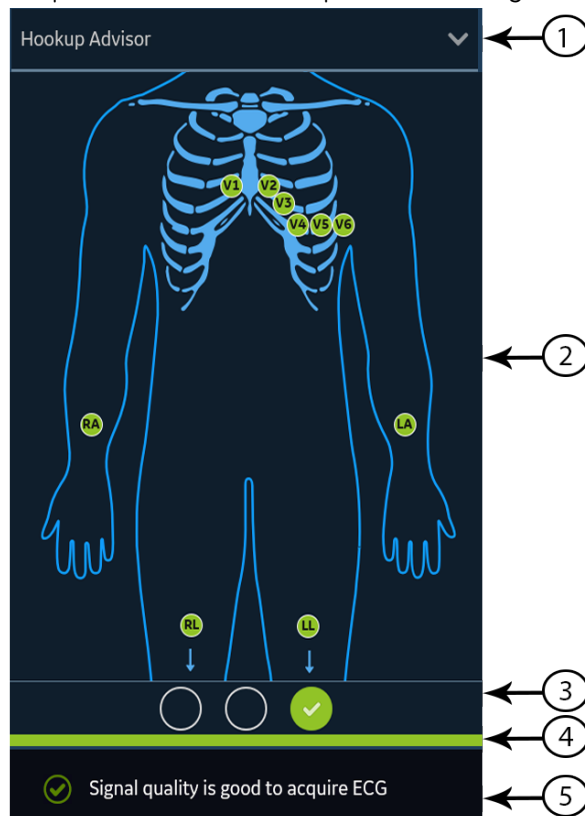





Table 11: Hookup Advisor Panel

Item	Name	Description
1	Collapse arrow	Select the arrow to collapse the electrode placement image.
2	Electrode Placement Image	<p>Displays electrode placement and quality of each lead. Each lead quality indicator changes color to red, yellow or green, based on its connection status.</p> <p>On the Acquisition screen, the image displays the real-time electrode quality of each lead.</p> <p>During preview of an ECG patient report, the image displays the electrode quality of each lead at the time of ECG acquisition; not the real-time electrode quality of each lead.</p> <p>During review of a patient report, all electrode lead quality indicators are turned off.</p> <p>You can set up a lead condition indicator in settings, if the Hookup Advisor level is configured as:</p> <ul style="list-style-type: none"> • Yellow, the image automatically expands when the Hookup Advisor status is yellow or red in the Acquisition screen, or during preview of an ECG patient report. • Red, the image automatically expands when the Hookup Advisor status is red in the Acquisition screen, or during preview of an ECG patient report. <p>The image collapses during review of a patient report, irrespective of the overall Hookup Advisor status.</p> <ul style="list-style-type: none"> • Never, the image does not automatically expand when the overall Hookup Advisor status is yellow or red. Only the Hookup Advisor lead quality status indicator and status messages display in the Notification Area.
3	Lead Quality Status Indicator	Displays three circles that change color to yellow, red, or green, based on the overall lead quality. This indicator does not apply to review of rhythm reports.
4	Status Bar	Displays a solid color bar that matches the same color as the lead quality status indicator. For example, if the lead quality status indicator is green, the status bar displays a solid green color. In the pre-acquisition (refer to ECG Acquisition Overview on page 44) mode, when the lead quality status indicator changes from red or yellow to green, the status bar shows a progress bar of acquiring 10 seconds of ECG data with good quality.
5	Notification Area	Displays lead quality status messages indicating the specific problem in each lead. Messages display one at a time. If there are more than one failures, messages for red states display first. When you resolve a problem, the next message displays. Continue to resolve the problems until the indicator is green.

Table 12: Lead Quality Indicators on the Electrode Placement Image

Lead Quality Indicator	Description
Green	The leadwire connection is good. The acquisition module is sending a good signal to the device.
Yellow	The leadwire connection is experiencing noise and the signal is not clear.
Red	The lead is disconnected or not receiving a usable signal.
No color (unlit)	No ECG data is being acquired.

Table 13: Hookup Advisor Lead Quality Status Indicators

Indicator	Description
<p>Red</p> 	<p>Shows a lead fail condition or extreme baseline shifts.</p> <p>The red indicator is always the left circle of the indicator. It flashes on and off approximately each second and contains an X symbol. The two circles to the right are black.</p> <p>A message displays with information to help you resolve the problem.</p>
<p>Yellow</p> 	<p>Shows muscle artifact, power line interference, baseline wander, or electrode noise.</p> <p>The yellow indicator is always the middle circle of the indicator and contains a dash. The left and right circles are black.</p> <p>A message displays with information to help you resolve the problem.</p>
<p>Green</p> 	<p>Shows acceptable signal quality.</p> <p>The green indicator is always the right circle of the indicator and contains a check mark. The two circles to the left are black.</p> <p>A message displays showing that the signal lead quality is good to acquire an ECG.</p>

NOTE:

The background color of the **Start ECG** icon is green, when the **Hookup Advisor** status is green. The background color of the **Start ECG** icon is blue, when the **Hookup Advisor** status is red or yellow.

If the **Hookup Advisor** status is red or yellow, check the patient's skin, see [Prepare the Patient's Skin on page 134](#).

If a leadwire is disconnected, the overall status shows as failed (red). To determine which leadwire has failed, you need to understand which electrodes are used to form a lead. If RA is the reference electrode and it is not connected, all the electrodes display as failed. If another leadwire is the reference electrode and it is not connected, only that electrode displays as failed.

CAUTION:

ELECTRICAL INTERFERENCE - Electrostatic discharges may interfere with the acquisition of ECG recordings. The acquisition module could be temporarily

disconnected with an error message displayed due to an ESD event. The device recovers automatically from this error. ECG recordings need to be restarted after the error message is removed and the acquisition module recovers.

If the device does not recover from the error, troubleshoot the error. Restart the ECG after the error is resolved and the **Hookup Advisor** displays a green status. After you resolve the errors, the electrode placement image collapses after the **Hookup Advisor** status indicator is green for at least four seconds.

The preview or review of a patient report is based on the **Hookup Advisor** status at the time of ECG acquisition, and not the real-time status of a currently connected patient.

Acquire an ECG based on the Hookup Advisor status in Post-Acquisition Mode

In post-acquisition mode (refer to [ECG Acquisition Overview on page 44](#)), the next 10 seconds of ECG data is acquired when you start to record an ECG.

Review the Hookup Advisor status before you start an ECG. If the Hookup Advisor status is green, it shows that the signal quality is good, you can start to record an ECG that acquires the next 10 seconds of ECG data.

- If the status stays green during the 10 seconds ECG acquisition, you can accept the ECG.
- If the quality of the ECG signal has problems during the 10 seconds ECG acquisition, the status changes from green to yellow or red.

It is recommended to reject an ECG that is acquired in the post-acquisition mode with poor signal quality.

Acquire an ECG based on the Hookup Advisor status in Pre-Acquisition Mode

In pre-acquisition mode (refer to [ECG Acquisition Overview on page 44](#)), the previous 10 seconds of ECG data is acquired when you start to record an ECG.

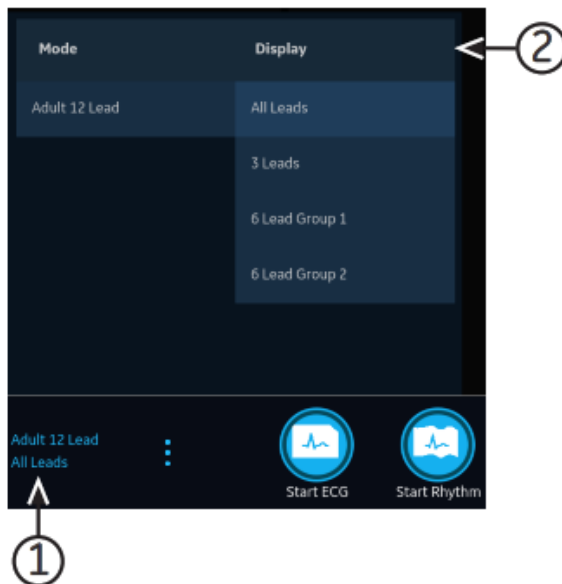
Review the Hookup Advisor status before you start an ECG:

- If the status is green, it shows that the previous 10 seconds of ECG data is good. You can start to record an ECG.
- If the status changes from green to yellow or red, it shows that the quality of the ECG signal is not good. A message displays for the most critical state in the last 10 seconds.
- If the status changes from yellow or red to green, Hookup Advisor displays a message that you need to wait for 10 seconds before you start to record an ECG.

Change Lead Sets and Lead Formats

The Acquisition screen displays the waveform based on the configured lead format, lead set, speed, gain, and filter. After you start a new patient, you can change the lead set or lead format on the Acquisition screen.

1. At the bottom, left-side of the Acquisition screen, select anywhere to the left of the ellipsis icon (1).



The **Mode** and **Display** menus (2) are expanded.

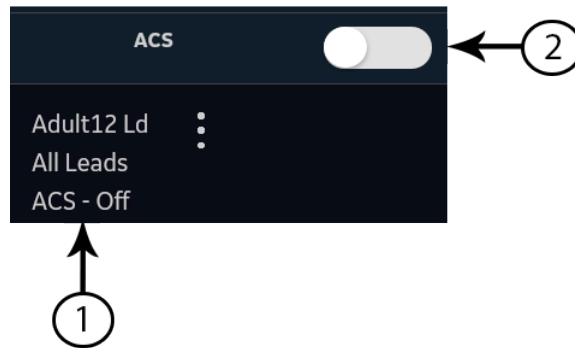
2. Select a different lead set below **Mode**.
If you change the lead set, it resets the acquisition of data and cannot be done while recording or printing a rhythm.
The selected lead set is applied to the waveform.
3. Select a different lead format below **Display**.
The selected lead format is applied to the waveform. Select anywhere outside the menu to collapse it.
These changes apply only to the current patient test(s). If you start a new patient, the changes reset to the values configured for the device.

Enable ACS Interpretation

You can enable the ACS option on the Acquisition screen before you record an ECG patient test if the ACS option, which detects Acute Coronary Syndrome, is bought and activated on the device.

This option records a resting ECG with ACS interpretation statements. By default, ACS interpretation statements are disabled for each patient. ACS must be enabled on a per-patient basis.

1. At the bottom, left side of the Acquisition screen, select anywhere to the left of the ellipsis icon (1).



The **ACS** option displays in the expanded menu.

- Turn the **ACS** option (2) on to enable ACS interpretation statements for the patient report.

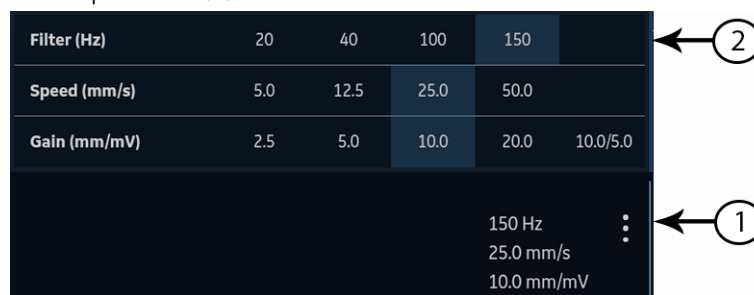
If you enable this option, it will stay enabled for the subsequent patient test(s) for that visit. It must be enabled again for the next patient.

If the patient demographics show that the patient is younger than 16 years of age, the device records a pediatric ECG with a standard 12SL analysis. The ACS algorithm is not executed.

Change Speed, Gain, and Filter

The Acquisition screen displays the waveform based on the configured speed, gain, and filter. After starting a new patient, you can change the speed, gain, or filter on the Acquisition screen.

- At the bottom, right-side of the Acquisition screen, select anywhere to the left of the ellipsis icon (1).



The **Filter (Hz)**, **Speed (mm/s)**, and **Gain (mm/mV)** menu (2) expands.

- To adjust the speed, gain, and filter of the waveform, select a different value from the list.

The selected values are applied to the waveform. Select anywhere outside the menu to collapse it.

These changes apply only to the current patient test(s). If you start a new patient, the changes reset to the values configured for the device.

ECG Acquisition Overview

You can record an ECG in pre-acquisition or post-acquisition modes.

Table 14: ECG Acquisition Modes

Acquisition Mode	Description
Pre-acquisition	When you start recording an ECG: <ul style="list-style-type: none"> • If 10 seconds of ECG data is available, the system records the previous 10 seconds of data for analysis. • If 10 seconds of ECG data is not available, the system continues recording until 10 seconds of ECG data is obtained.
Post-acquisition	When you start recording an ECG, the system records the next 10 seconds of data for analysis.

If the **Auto-ECG** option is enabled on the device, the device automatically records one ECG for each new patient. For more information on automatic ECG acquisition, see [Automatically Acquire an ECG on page 44](#).

To record an ECG patient test manually, see [Manually Start an ECG recording on page 45](#).

Automatically Acquire an ECG

Start a test for a new patient. For more information, see [Start a Test for a New Patient on page 28](#).

Make sure that your administrator enables the **AECG - Auto ECG** option.

The system starts to automatically record an ECG:

- When **AECG - Auto ECG** option is enabled.
- If the **Hookup Advisor** status is green.
- If you are viewing the scrolling waveforms in the **Live** tab.

The automatic acquisition of ECG happens only once per patient connection.

The **Stop Auto ECG** icon displays the count of acquisition progress until you record 10 seconds of data. After acquiring 10 seconds of data with good signal quality, the recording stops and a preview of the ECG patient report displays in the **ECG** tab.

If you record the ECG before you enter patient information in the **Patient Information** screen, you can edit patient information before accepting the preview. For more information, see [Accept or Reject an ECG Patient Report on page 47](#).

Automatic ECG acquisition is triggered only one time for the current patient test. Start any new ECG tests for that same patient manually.

When Auto-ECG is in progress, the **Start ECG** button changes to the **Stop ECG** button:

- If you select the **Stop ECG** button, automatic ECG acquisition stops and the **Start ECG** button displays.
- If you select the **Start ECG** button, ECG acquisition starts manually.

If you perform other functions during automatic ECG acquisition, a message displays in the notification area. For example:

- If you perform Start New Patient - a message displays that *unsaved data will be lost*.
- If you navigate to Settings - a message displays that *cannot perform this action*.

Select **Cancel**, to continue to perform automatic ECG acquisition and retain current patient data. If you select **Continue**, automatic ECG acquisition stops.

The automatic ECG function is aborted and the device will function in manual ECG mode if:

- An automatic ECG acquisition is stopped before 10 seconds of data is acquired.
- The preview of an ECG that was automatically acquired is rejected.

Manually Start an ECG recording

1. Start a test for a new patient. For more information, see [Start a Test for a New Patient on page 28](#).

NOTE:

If you want to record an ECG for the current patient, do not start a new patient test.

2. Change the lead set or format, gain, speed, or filter, if required. For more information, see [Change Lead Sets and Lead Formats on page 41](#) and [Change Speed, Gain, and Filter on page 43](#).
3. Select the **Start ECG** icon at the bottom of the Acquisition screen to start recording the patient ECG.



In pre-acquisition mode, the system checks if 10 seconds of ECG data is available.

- If 10 seconds of ECG data is available, the system records the previous 10 seconds of data for analysis. You cannot stop or cancel the acquisition at this time.
- If 10 seconds of ECG data is not available, the system continues recording until 10 seconds of ECG data is obtained. The **Start ECG** icon changes to

Stop ECG, and the count of acquisition progress displays on the icon until you have recorded 10 seconds of data. You can cancel the acquisition before 10 seconds of data is recorded. For more information, see [Cancel an ECG on page 47](#).

In post-acquisition mode, the system starts recording the next 10 seconds of ECG data for analysis. The **Start ECG** icon changes to **Stop ECG**, and the 10 seconds count of acquisition progress displays on the icon. You can cancel the acquisition before 10 seconds of data is recorded. For more information, see [Cancel an ECG on page 47](#).

The patient ECG test report begins generating. Based on the print preview mode configuration and the **Hookup Advisor** status, the recorded ECG patient test opens in a separate tab.

<i>If ...</i>	<i>Then ...</i>
Print preview mode is configured as Always	The ECG patient report preview is displayed in the ECG tab for you to accept or reject the report. For more information on how to accept or reject the report, see Accept or Reject an ECG Patient Report on page 47 .
Print preview mode is configured as Yellow and the Hookup Advisor Status is Yellow or Red	
Print preview mode is configured as Red and the Hookup Advisor Status is Red	

If ...	Then ...
Print preview mode is configured as Yellow and the Hookup Advisor Status is Green	The ECG patient report preview is not displayed. The ECG patient report is automatically accepted, saved in the Files list, and displayed in the ECG tab for review. For more information, see Review an ECG Patient Report on page 51 .
Print preview mode is configured as Red and the Hookup Advisor Status is Yellow or Green	The report is automatically printed. For more information, see Automatically Print an ECG Patient Report on page 53 .
Print preview mode is configured as Never	<p>If a destination is configured for ECG reports to be automatically sent after acquisition, the ECG report is automatically added to the queue of pending reports to be sent to the configured destination. For more information, see Display the Report Queue on page 95.</p> <p>NOTE: Based on the Mandatory fields apply for Transmission settings, the ECG report is not added to the transmission queue until you enter the patient demographic data for the mandatory fields. An error message displays in the notification area. You need to complete the data for the mandatory fields and manually resend the report to a configured destination.</p> <p>NOTE: Based on the Mandatory fields apply for Acquisition settings, the ECG report is not accepted, transmitted, or printed until you enter the patient demographic data for the mandatory fields. An error message Unable to accept. Incomplete patient data. displays on the Acquisition screen. You need to complete the data for the mandatory fields to accept the ECG report.</p>

Cancel an ECG

You can stop recording an ECG before 10 seconds of data are recorded.

Select the **Stop ECG** icon at the bottom of the Acquisition screen to cancel the ECG acquisition:



The device stops recording the ECG data and the **Start ECG** icon displays.

Accept or Reject an ECG Patient Report

CAUTION:

DELAY IN TREATMENT - Unaccepted ECGs in the preview screen will be automatically rejected and deleted when all patient leads are disconnected and the MAC 7 device is inactive for 2 minutes.

A preview of the recorded 10 seconds of data displays in the **ECG** tab in the configured preview report format if:

- The ECG is recorded in automatic ECG mode.
- Your administrator has configured the preview mode to display the recorded 10 seconds of data.
- The 10 seconds of ECG is selected from the Full Disclosure screen.

NOTE:

The **Full Disclosure** tab displays after you purchase and enable the Full Disclosure option.

You can accept this preview to save the ECG patient report in the **Files** tab, or reject it and start another ECG.

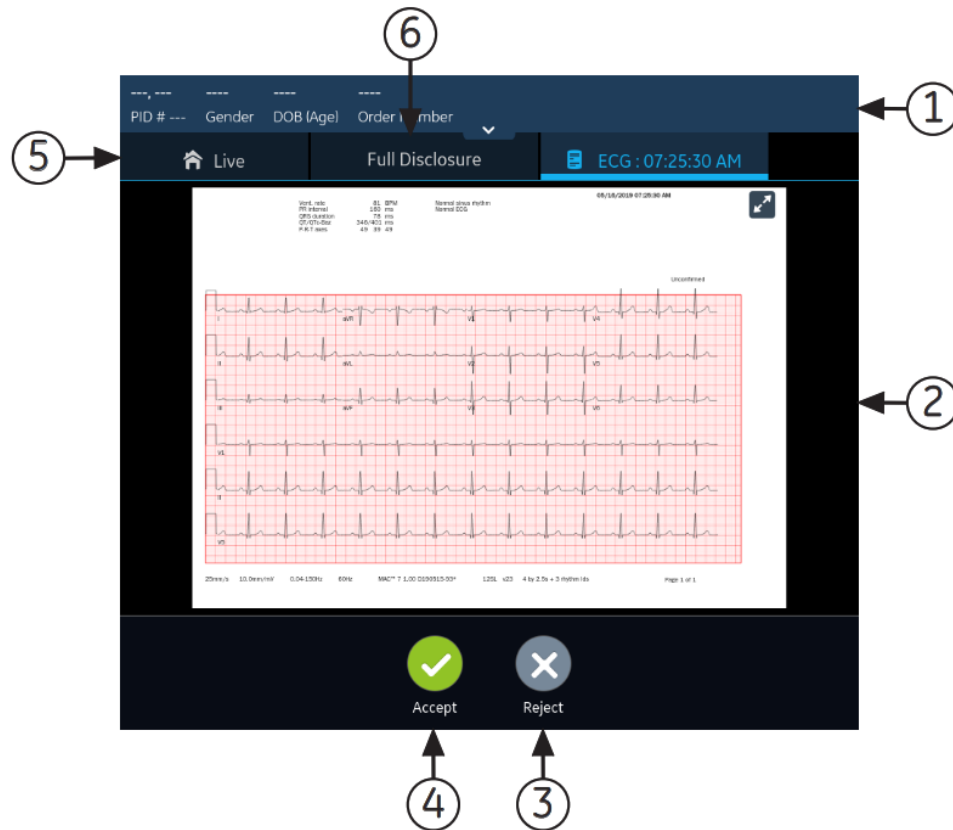


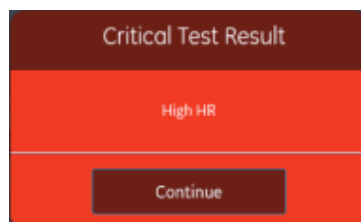
Table 15: ECG Tab Displaying a Preview of the ECG Patient Report

Item	Name	Description
1	Patient Information Banner	Displays patient information. Select anywhere in the Patient Information banner to edit patient information for the patient report. Modify the information by using the software keyboard, attaching an order, scanning the patient barcode, selecting a patient from the Patients tab, or performing an ADT query.

<i>Item</i>	<i>Name</i>	<i>Description</i>
2	Preview of ECG patient report	Displays the preview of the ECG patient report. If a patient report contains multiple pages, a part of another page is displayed on the right-side of the screen. Press the left and right arrows on the screen to navigate from one page to another. For more information on the report formats and the standard layout of the ECG patient report, see ECG Report Formats on page 123 .
3	Reject icon	Select the Reject icon to return to the live waveform display in the Acquisition screen.
4	Accept icon	Select the Accept icon to accept the preview of the ECG patient report and save it in the Files list. The accepted ECG patient report is refreshed and displayed in the same tab for review with additional options.
5	Live tab	Select the Live tab to return to the live waveform displayed in the Acquisition screen. The current ECG preview is retained until you record another ECG, or go back to the preview and accept or reject it.
6	Full Disclosure tab	Click the Full Disclosure tab from the patient record menu bar to navigate to the Full Disclosure waveform and application. The ECG Preview does not change until you accept or reject the ECG Preview or record the new ECG.

To accept or reject the ECG preview, perform the steps as follows:

1. Review the patient report and **Hookup Advisor** status.
2. If the **CRIT- Critical Value Notifications** option is enabled on the device, and one or more critical values are detected during ECG acquisition, a window opens on top of the **ECG** tab displaying critical value notifications in the order in which they are detected.



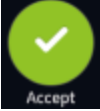
3. Select **Continue** to acknowledge each notification.


If you try to perform other functions such as accessing the **Settings** or **Service** screen prior to accepting or rejecting the ECG, a message displays indicating that the ECG is not saved, and the preview will be lost if you navigate to the screen.

Select one of the options as follows:

- If you select **Continue**, the preview will be lost.

- If you select **Cancel**, you can proceed to accept or reject the ECG preview.
4. Accept or reject the ECG preview based on the **Hookup Advisor** status.

If ...	Then ...	Next Steps
<p>Hookup Advisor status is green, the ECG signal quality is good. The Accept icon is highlighted in green. The Reject icon is not highlighted.</p>	<p>Select the Accept icon:</p>  <p>The preview of the ECG patient report is accepted and saved in the Files list. The patient report is refreshed and displayed in the same tab for review with additional options.</p>	<ul style="list-style-type: none"> • Review the ECG patient report and decide on the next steps. For more information, see Review an ECG Patient Report on page 51. • The ECG patient report is automatically printed. For more information, see Auto-print an ECG Report. • The patient report is added to the queue of pending reports to be sent to the configured automatic destination. For more information, see Display the Report Queue on page 95. <p>NOTE: Based on the Mandatory fields apply for Transmission settings, the ECG report is not added to the transmission queue until you enter the patient demographic data for the mandatory fields. An error message displays in the notification area. You need to complete the data for the mandatory fields and manually resend the report to a configured destination.</p> <p>NOTE: Based on the Mandatory fields apply for Acquisition settings, the ECG report is not accepted, transmitted, or printed until you enter the patient demographic data for the mandatory fields. An error message Unable to accept. Incomplete patient data. displays on the Acquisition screen. You need to complete the data for the mandatory fields to accept the ECG report.</p>

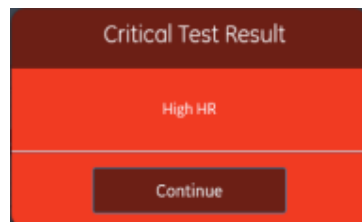
If ...	Then ...	Next Steps
<p>Hookup Advisor status is yellow or red, there are issues with the ECG signal quality during the recording of this ECG. The Reject icon is highlighted in blue to reflect the status of Hookup Advisor. The Accept icon is not highlighted.</p>	<p>Select the Reject icon:</p>  <p>The ECG patient report is discarded. The ECG Preview tab closes and returns to the Acquisition screen.</p>	<p>Start a new ECG on the same patient. For more information, see ECG Acquisition Overview on page 44.</p>

Review an ECG Patient Report

The reviews of ECG patient reports are automatically closed 2 minutes after disconnecting patient leads and inactivity with the MAC 7 device.

After the 10 seconds ECG is acquired and the ECG preview is accepted, the patient report is displayed in the **ECG** tab in the configured report format for review.

If the **CRIT** option is enabled on the device, and one or more critical values are detected during ECG acquisition, a window opens on top of the **ECG** tab displaying the notifications for the critical values in the order in which they are detected.



Select **Continue** to acknowledge the notification and proceed with other tasks.

Record an ECG or Rhythm

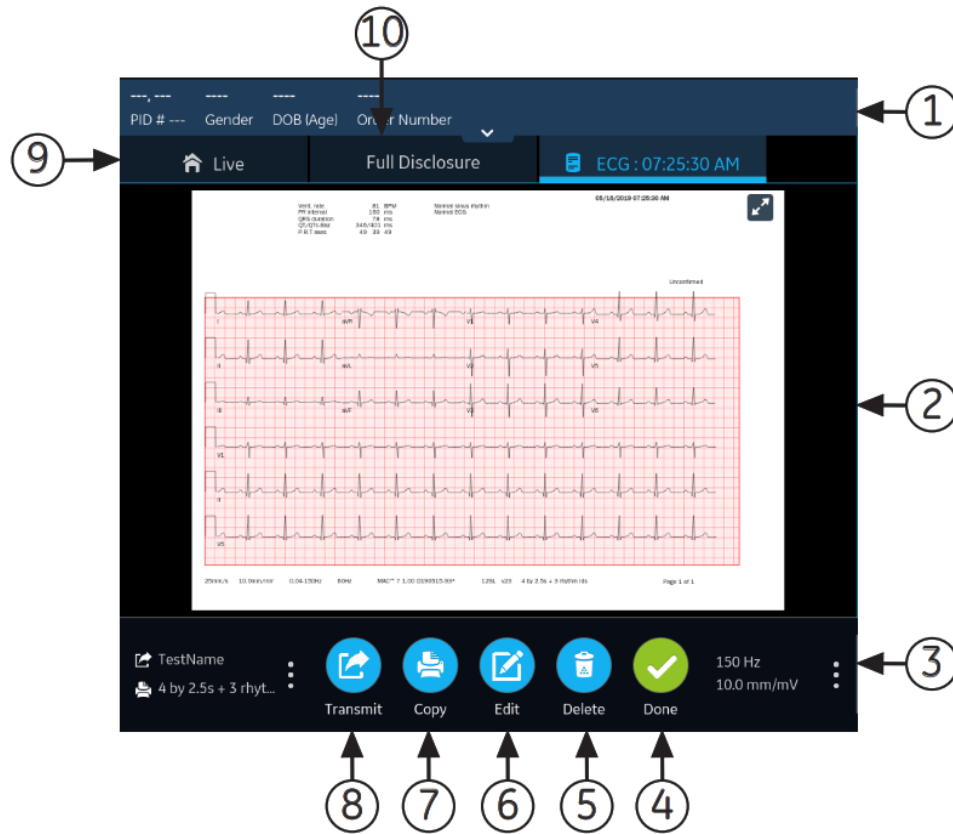


Table 16: ECG Tab Displaying an ECG Patient Report for Review

Item	Name	Description
1	Patient Information Banner	Displays patient information such as patient first name, last name, gender, age, and so on. Select anywhere in the Patient Information banner to edit patient information for the patient report.
2	ECG patient report	Displays the ECG patient report. If a patient report contains multiple pages, a part of another page is displayed on the right-side of the screen. Select the left and right arrows on the screen to navigate from one page to another. For more information on the report formats and the standard layout of the ECG patient report, see ECG Report Formats on page 123 .
3	Gain and Filter	To change the waveform gain or filter, select anywhere around the ellipsis icon next to Gain and Filter and select a new value from the expanded list. The patient report is refreshed with the selected gain and filter.
4	Done icon	Closes the patient report after completing your tasks. For more information, see Close a Patient Report on page 63 .
5	Delete icon	Deletes the patient report. For more information, see Delete a Patient Report on page 62 .

<i>Item</i>	<i>Name</i>	<i>Description</i>
6	Edit icon	Edits patient information for the patient report. For more information, see Edit Patient Information in a Patient Report on page 62 .
7	Copy icon	Prints a copy of the patient report. For more information, see Print a Patient Report on page 60 .
8	Transmit icon	Transmits the patient report. For more information, see Transmit a Patient Report to a Configured Destination on page 57 .
9	Live tab	Select the Live tab to return to the live waveform display in the Acquisition screen.
10	Full Disclosure tab	Click the Full Disclosure tab from the patient record menu bar to navigate to the Full Disclosure waveform and application. NOTE: The Full Disclosure tab displays after you purchase and enable the Full Disclosure option.

To start a new ECG on the same patient, select the **Live** tab to return to the live waveform display in the Acquisition screen, and restart the ECG. For more information, see [ECG Acquisition Overview on page 44](#).

After you select **Done** on the **Review** screen of an ECG patient report, disconnect patient leads before you select **New Patient** on the MAC 7 device.

To start an ECG for a new patient, select **Start New Patient**. For more information, see [Start a Test for a New Patient on page 28](#).

To start a new 10 seconds ECG on the same patient from the Full Disclosure tab, click the **Full Disclosure** tab from the patient record menu bar to navigate to the Full Disclosure waveform and application, and select 10 seconds ECG from the Full Disclosure waveform. For more information, see [Record a Full Disclosure ECG on page 64](#).

To start a new 10 seconds ECG on the same patient from the Full Disclosure tab, click the **Full Disclosure** tab from the patient record menu bar to navigate to the Full Disclosure waveform and application, and select 10 seconds ECG from the Full Disclosure waveform. For more information, see [Record a Full Disclosure ECG on page 64](#).

Automatically Print an ECG Patient Report

When a patient report is saved in the **Files** list, it is automatically printed in the configured report formats.

The configured report formats determine the following:

- Number of copies printed
- Inclusion or exclusion of 12SL interpretation statements
- Printing of all reports

- Printing of only the reports interpreted by the 12SL analysis as abnormal

The ECG patient report is printed in the order in which it was received. If no other patient reports are printing, the report is printed immediately.

You will see a progress message at the bottom of the screen indicating the printing status.

If the device is configured to print the barcode of the patient ID in the patient reports, the printed patient report includes the barcode. The barcode can be used to perform a query by patient ID in the MUSE system.

If a printer error occurs, the progress message is replaced by the related printer error. The printing restarts automatically after the error is resolved. For more information on printer errors, see [Printing Errors on page 116](#).

To stop printing a patient report, select the **Stop** icon in the middle of the screen.

All pending print jobs are cancelled.

Record a Rhythm

Make sure that sufficient paper is available in the paper tray to print a rhythm report.

If the **DRHM - Digital Rhythm** option is purchased and enabled on the device, a rhythm report can be stored in digital form in the **Files** list or printed on paper, depending on how the device has been configured for your site. A digital rhythm report cannot be transmitted to a configured automatic destination.

1. Start a test for a new patient. See [Start a Test for a New Patient on page 28](#).
2. Change the lead set or format, gain, speed, or filter, if required. See [Change Lead Sets and Lead Formats on page 41](#).
3. Select the **Start Rhythm** icon on the Acquisition screen to start the rhythm for the patient.



The **Start Rhythm** icon on the Acquisition screen changes to **Stop Rhythm**. A count of the recording progress starting at one-second displays on the icon if the configured rhythm mode is **Digital Only** or **Both**.

If the **Delay Rhythm Printing** option is disabled, the rhythm for the patient is recorded and/or printed in real-time.

If the **Delay Rhythm Printing** option is enabled, the rhythm for the patient is recorded and/or printed with the previous 10 seconds data.

<i>If the Rhythm Mode is ...</i>	<i>Then</i>
Paper Only	The rhythm is only printed. It is not digitally recorded. Go to step 4 to stop printing the rhythm. If you do not stop printing the rhythm, printing continues until the paper tray is out of paper.
Digital Only	The rhythm is only digitally recorded in real-time at the configured speed and for the configured duration. When the configured duration is reached, the rhythm stops recording. The digital rhythm report is displayed in a new Rhythm tab and saved in the Files list. The rhythm is not printed. Go to step 4 if you want to stop recording the rhythm before its configured duration is reached, otherwise go to step 5. NOTE: Digital Only is available only if you enable the DHRM - Digital Rhythm option.
Both	The rhythm for the patient is digitally recorded and printed in real-time at the configured speed and for the configured duration. When the configured duration is reached, the rhythm stops recording and printing. The digital rhythm report is displayed in a new Rhythm tab and saved in the Files list. Go to step 4 if you want to stop recording and printing the rhythm before its configured duration is reached, otherwise go to step 5. NOTE: Both is available only if you enable the DHRM - Digital Rhythm option.

If a printer error occurs and rhythm printing is stopped, you need to troubleshoot the error. For more information, see [Printing Errors on page 116](#). Digital rhythm continues even if there is a printing error. To restart rhythm printing, you must stop the digital rhythm and then restart both.

- Select the **Stop Rhythm** icon on the Acquisition screen to stop both digital rhythm recording and printing:



Select the **Stop** icon on the Report Printing screen to stop printing the rhythm report while the digital acquisition of rhythm continues.

- Review the rhythm report. For more information, see [Review a Digital Rhythm Report on page 56](#).

Review a Digital Rhythm Report

If the Digital Rhythm option is purchased and activated on the device, a rhythm report can be stored in digital form.

After the digital rhythm report is recorded, the report is displayed in the **Rhythm** tab for your review.

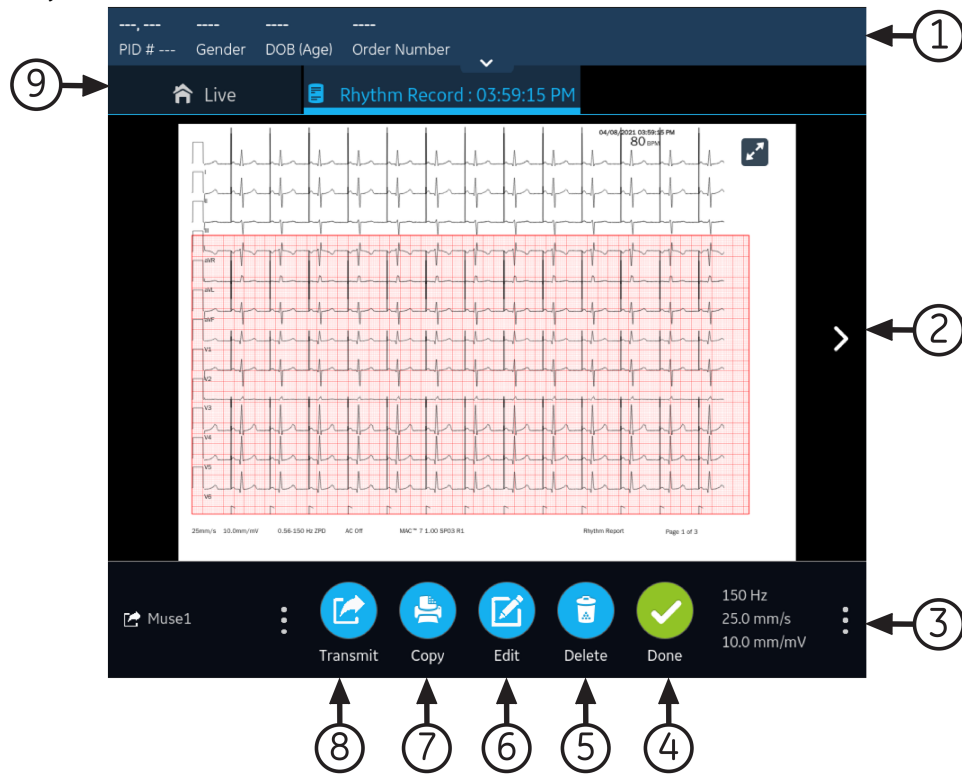


Table 17: Rhythm Tab

Item	Name	Description
1	Patient Information Banner	Displays patient information such as patient first name, last name, gender, age, and so on. Select anywhere in the Patient Information banner to edit patient information for the rhythm report.
2	Rhythm report	Displays the rhythm report. If a rhythm report contains multiple pages, press the left and right arrows on the screen to navigate from one page to another. For more information on the rhythm report format, see Rhythm Report Format on page 128 .
3	Gain, Filter, and Speed	To change the gain, filter, or speed of the waveform, select anywhere around the ellipsis icon on the lower, right corner of the Rhythm tab and select a new value from the expanded list. The rhythm report is refreshed with the selected gain, filter, and speed.
4	Done icon	Closes the rhythm report after completing your tasks. For more information, see Close a Patient Report on page 63 .

<i>Item</i>	<i>Name</i>	<i>Description</i>
5	Delete icon	Deletes the rhythm report. For more information, see Delete a Patient Report on page 62 .
6	Edit icon	Edits patient information for the rhythm report. For more information, see Edit Patient Information in a Patient Report on page 62 .
7	Copy icon	Prints a copy of the rhythm report. For more information, see Print a Patient Report on page 60 .
8	Transmit icon	Transmits the rhythm report. For more information, see Transmit a Patient Report to a Configured Destination on page 57 .
9	Live tab	Select the Live tab to return to the live waveform display in the Acquisition screen.

To start a new rhythm for the same patient, select the **Live** tab to return to the live waveform display in the Acquisition screen, and restart the rhythm. For more information, see [Record a Rhythm on page 54](#).

To start a rhythm for a new patient, select **Start New Patient**. For more information, see [Start a Test for a New Patient on page 28](#).

Transmit a Patient Report to a Configured Destination

Before you start the procedure, make sure that:

- You have the privilege to transmit patient reports to a configured destination.
- The USB flash drive supports the FAT32 file system.

Select the correct destination for your patient report. For more information, see the table below:

<i>Patient Report Type</i>	<i>Destination</i>	<i>Supported File Format</i>
Resting ECG	DCP server destination (MUSE v8 SP3 or higher, v9, or MUSE NX and MUSE DICOM Gateway Pro SP1 or higher)	Hilltop format
Resting ECG	USB R/W flash drive	PDF, Hilltop and Sapphire XML (Sapphire XML format is available if you enable the XML format output in the Option Manager) formats.
Resting ECG	SFTP server destination with remote directory path	PDF, Hilltop and Sapphire XML (Sapphire XML format is available if you enable the XML format output in the Option Manager) formats.

Record an ECG or Rhythm

<i>Patient Report Type</i>	<i>Destination</i>	<i>Supported File Format</i>
Resting ECG	Shared directory destination with folder path	PDF, Hilltop and Sapphire XML (Sapphire XML format is available if you enable the XML format output in the Option Manager) formats.
Digital Rhythm	USB R/W flash drive	PDF format
Digital Rhythm	DCP server destination (MUSE v9 SP6 or higher, or MUSE NX and MUSE DICOM Gateway Pro SP6 or higher)	PDF format
Digital Rhythm	SFTP server destination with remote directory path	PDF format
Digital Rhythm	Shared directory destination with folder path	PDF format
Full Disclosure	USB R/W flash drive	PDF format
Full Disclosure	DCP server destination (MUSE v9 SP6 or higher, or MUSE NX and MUSE DICOM Gateway Pro SP6 or higher)	PDF format
Full Disclosure	SFTP server destination with remote directory path	PDF format
Full Disclosure	Shared directory destination with folder path	PDF format

To transmit a patient report to the default or configured destination immediately after acquisition, perform the steps below:

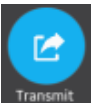
1. Review the patient report to confirm that it can be transmitted to the required destination.


To review an ECG patient report, see [Review an ECG Patient Report on page 51](#).

To review a rhythm report, see [Review a Digital Rhythm Report on page 56](#).

To review a Full Disclosure report, see [Review a Full Disclosure Report on page 66](#).

2. To transmit the report to the required destination, perform one of the steps below:

<i>To transmit the report ...</i>	<i>Perform the following:</i>
To the default destination	Select the Transmit icon: 

<i>To transmit the report ...</i>	<i>Perform the following:</i>
To another configured destination	<ol style="list-style-type: none"> 1. Select anywhere around the ellipsis icon on the left, bottom corner of the tab to view the Transmit menu. 2. From the expanded Transmit menu, select the destination where you want to transmit the patient report. 3. Select the Transmit icon:  <p>One or more destinations must be configured for the Transmit icon to be enabled. If no destinations are configured, the Transmit icon is disabled.</p>

The selected patient report is added to the **Queue**, processed and transmitted to the selected destination. The **Job Status** in the **Queue** is updated. For information on the status, see [Display the Report Queue on page 95](#).

The status of a manually submitted job displays on the notification bar in the lower, right-side of the screen in the format: **<Destination_Name>: <Job_Status>**.

For example, if the destination name is USB, and the job status is **Failed**, the status displays as follows: **USB: Failed**.

A tick mark displays in the **Sent** column of the **Files** expanded list for patient reports successfully transmitted to the default destination.

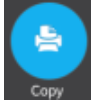
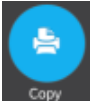
<i>If</i>	<i>Then</i>
The transmission queue has reached its maximum limit of 1000 reports, a message displays in the notification area that the transmission queue is full and no additional reports can be added.	Wait for the reports in the queue to transmit and try again.
The patient report has already been transmitted to the selected destination, a message displays in the notification asking you to confirm if you want to re-transmit the already transmitted report.	Perform one of the actions below: <ul style="list-style-type: none"> • Select Continue to re-transmit the patient report. • Select Cancel to cancel the report transmission.

<i>If</i>	<i>Then</i>
<p>Patient information is incomplete in the patient report (for example, mandatory fields are blank or contain invalid data), a message displays in the notification area indicating that the patient report cannot be transmitted because of incomplete patient data.</p> <p>NOTE: Based on the Mandatory fields apply for Transmission settings, the ECG report is not added to the transmission queue until you enter the patient demographic data for the mandatory fields. An error message displays in the notification area. You need to complete the data for the mandatory fields and manually resend the report to a configured destination.</p> <p>NOTE: Based on the Mandatory fields apply for Acquisition settings, the ECG report is not accepted, transmitted, or printed until you enter the patient demographic data for the mandatory fields. If you manually transmit ECG report, an error message Unable to transmit. Incomplete patient data. displays on the Acquisition screen. You need to complete the data for the mandatory fields to transmit the ECG report.</p>	<p>Perform the steps below:</p> <ol style="list-style-type: none"> 1. Edit the patient report to enter missing patient data. 2. Retry transmission.

Print a Patient Report

You can print a copy of a Rhythm, Full Disclosure, or ECG patient report in any configured report format for the selected lead set.

- An ECG patient report opens in the **ECG** tab.
 - A Rhythm report opens in the **Rhythm** tab.
 - A Full Disclosure report opens in the **FD Report** tab.
1. Before printing a copy of the report, review the patient report and verify:
 - The patient information in the patient report is correct.
 - The ECG or Rhythm or Full Disclosure ECG is acquired with the desired gain and filter.
 2. Perform one of the following steps:

To print a copy of the patient report ...	Perform the following:
In the default or selected report format displayed on the ECG or Rhythm or FD Report tab	<p>Select the Copy icon:</p>  <p>A job to print one copy of the patient report in the default report format is sent to the printer.</p>
In a different report format	<ol style="list-style-type: none"> 1. Select anywhere around the ellipsis icon on the left, bottom corner of the ECG tab to view the Copy Format menu. 2. From the expanded Copy Format menu, select the desired report format to be used to print a copy of the report. Only the report formats supported for the lead set used to record the ECG or rhythm are available for selection. For example, if a 12-lead ECG is recorded, only 12-lead ECG patient report formats are available for selection. 3. Select the Copy icon:  <p>The patient report is refreshed and displayed in the ECG tab in the selected report format. A job to print one copy of the ECG or rhythm in the selected report format is sent to the printer.</p>

The patient report is printed in the order in which it was received. If no other patient reports are printing, the report is printed immediately. The printing status displays at the bottom of the screen.

NOTE:

Based on the **Mandatory fields apply for Acquisition** settings, the ECG report is not accepted, transmitted, or printed until you enter the patient demographic data for the mandatory fields. An error message **Unable to print. Incomplete patient data.** displays on the **Acquisition** screen. You need to complete the data for the mandatory fields and reprint the patient report.

If a printer error occurs, the progress message is replaced by the printer error. The printing restarts automatically after the error is resolved. For more information on printer errors, see [Printing Errors on page 116](#).

If the device is configured to print the barcode of the patient ID in the patient reports, the printed patient report includes the barcode. The barcode can be used to perform a query by patient ID in the MUSE system.

3. To stop printing a patient report, select the **Stop** icon in the middle of the screen.



Edit Patient Information in a Patient Report

Make sure that you have the privilege to edit patient reports.

After a test is acquired, you can edit patient information using the software keyboard or by attaching an order. When an order is attached to a patient test, some fields are read-only.

If you try to edit or attach an order to a patient report that is transmitted to the default destination, an error message displays.

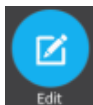
You cannot edit patient information by scanning a patient barcode, selecting a patient record from the **Patients** list, or performing ADT queries.

WARNING:

INACCURATE PATIENT DATA - Incorrect patient information can cause patient data mismatch. Data assigned to the wrong patient causes erroneous patient data that can affect diagnosis and treatment.

Be sure to check the patient information screen for each new patient. Make sure that you enter patient data for the correct patient.

1. To edit patient information for the patient report, select the **Edit** icon in the **ECG** tab or the **Rhythm** or **FD Report** tab in the Acquisition screen:



The **Patient Information** screen opens.

2. Edit the patient information using a software keyboard. See [Enter or Edit Patient Information Using the Software Keyboard on page 36](#).
3. Select **Save** to save your changes for this patient and collapse the screen.

If you select any other icons at the bottom of the tab prior to saving, the **Patient Information** screen collapses and the edited patient information is saved.

The updated patient information displays on the patient report.

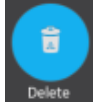
Delete a Patient Report

Make sure that you have the privilege to delete Rhythm, Full Disclosure, or ECG patient reports.

NOTE:

If you do not have the privilege to view patient reports, but you have the privilege to delete patient reports, you can only view and delete patient reports you created in the current session.

1. Select the **Delete** icon in the **ECG** tab or the **Rhythm** or the **FD Report** tab on the Acquisition screen to delete the patient report:




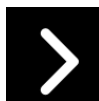


A message displays asking you to confirm if you want to permanently delete the patient report.

2. Select **Delete** to delete the patient report.
The selected patient report(s) are deleted from the **Files** list.
3. A confirmation message may display if you are trying to delete a patient report that has not yet been transmitted to the default destination (if a message has been configured by your administrator). Perform one of the actions below:
 - Select **Delete** to delete the patient report. The selected patient report is deleted from the **Files** list. Deleting the patient report closes the tab where it was opened for viewing, and returns you to the **Live** tab.
 - Select **Cancel** to cancel the deletion. The selected patient report is not deleted from the **Files** list.

View the Patient Report

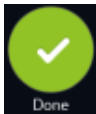
You can use the icons in the ECG, Rhythm, or Full Disclosure report tab to view the patient report:

<i>Icon</i>	<i>Name</i>	<i>Description</i>
	Maximize View	Select this icon or double-tap the patient report to maximize the view of the patient report.
	Minimize View	Select this icon or double-tap the maximized patient report to minimize the view of the patient report.
	Previous	Select this icon to navigate to the previous page of the multiple-page reports.
	Next	Select this icon to navigate to the next page of the multiple-page reports.

Close a Patient Report

1. Review the patient report.

2. After completing your tasks, select the **Done** icon in the **ECG** tab or the **Rhythm** tab to close the patient report.



A message displays asking you if you want to start a new patient test.

Select one of the options below:

- **Start New Patient** to start a test for a new patient, see [Start a Test for a New Patient on page 28](#). This action will clear the previous patient information.
- **Continue with Same Patient** to start a new test for the same patient. The live waveform for this patient displays on the screen.

Full Disclosure Overview

The Full Disclosure ECG option shows one lead of the patient waveform for a maximum of 5 minutes. From this waveform, you can create a Full Disclosure report (FD Report) or create a 12-lead ECG. It starts after you connect a patient to the acquisition module AND you are viewing the waveforms.

This feature may be helpful for clinicians that need to acquire an ECG on:

- A child that will not sit still or is anxious.
- A patient that is experiencing symptoms or stable arrhythmias and would require a 12 lead ECG during those symptoms.

You can acquire a Full Disclosure ECG only if you purchase the Full Disclosure option, and enable it in the **Options Manager**.

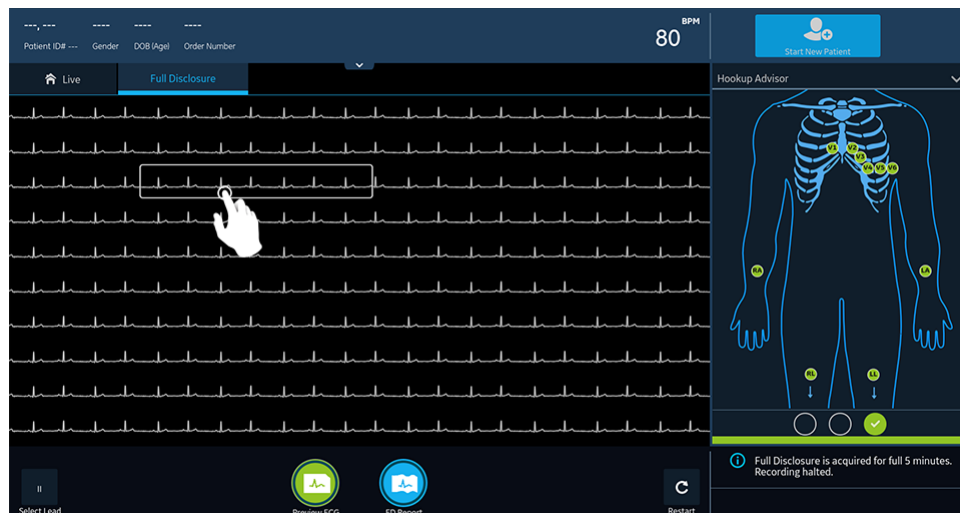
Automatic acquisition of ECG does not start while in the **Full Disclosure** tab. Automatic ECG acquisition stops when you change from the **Live** tab to the **Full Disclosure** tab.

Record a Full Disclosure ECG

Before you start this procedure, make sure:

- You purchase and enable the Full Disclosure option in the **Options Manager**.
 - You enable the Full Disclosure option in the **Setting** screen.
1. Start a new patient test.
 2. To view a Full Disclosure ECG, click the **Full Disclosure** tab on the Acquisition screen.
 - One lead of the Full Disclosure ECG displays. The Full Disclosure shows the waveform from the left to right side of the screen.

- The Full Disclosure ECG records for a maximum of 5 minutes. The recording stops after the 5 minutes is complete.
 - The Full Disclosure screen displays 10 lines of ECG data and each line is of 30 seconds.
 - A notification message displays on the **Acquisition** screen after the Full Disclosure ECG records for 5 minutes.
 - The Full Disclosure screen displays the previous 5 minutes of Full Disclosure ECG data.
 - If the acquisition module is disconnected, a Full Disclosure ECG does not record and shows the empty space on the display.
3. To change the lead, click **Select Lead**.
- All the configured leads display. Select the single lead you want to display on the screen and on the printed FD reports. If you connect the leads to a patient after being fully disconnected for at least 30 seconds, all the data will be cleared from the display.
- The ECG recording restarts and the selected lead is applied to the Full Disclosure waveform. All the previous recorded data will be cleared.
4. To restart the Full Disclosure ECG, click **Restart**. All of the current waveform data is deleted.
- The message *unsaved data will be lost. Confirm to proceed* displays.
5. To record a 10 seconds ECG when in the Full Disclosure screen, do the steps that follow:



- Select anywhere on the Full Disclosure ECG. The 10 seconds of ECG data is selected.
- Click **Preview ECG**.

A preview of the recorded 10 seconds of data for all leads displays in the configured preview report in the maximize view. Select the minimize icon to view the report in the ECG tab.

- c) To accept or reject an ECG Patient Report, see [Accept or Reject an ECG Patient Report on page 47](#).
 - d) To review an ECG Patient Report, see [Review an ECG Patient Report on page 51](#).
6. To generate a Full Disclosure report, click **FD Report**.
- The Full Disclosure report for the selected lead displays in the **FD Report** tab for your review.
7. To review the Full Disclosure report, see [Review a Full Disclosure Report on page 66](#).

Review a Full Disclosure Report

The Full Disclosure report displays in the **FD Report** tab for your review.

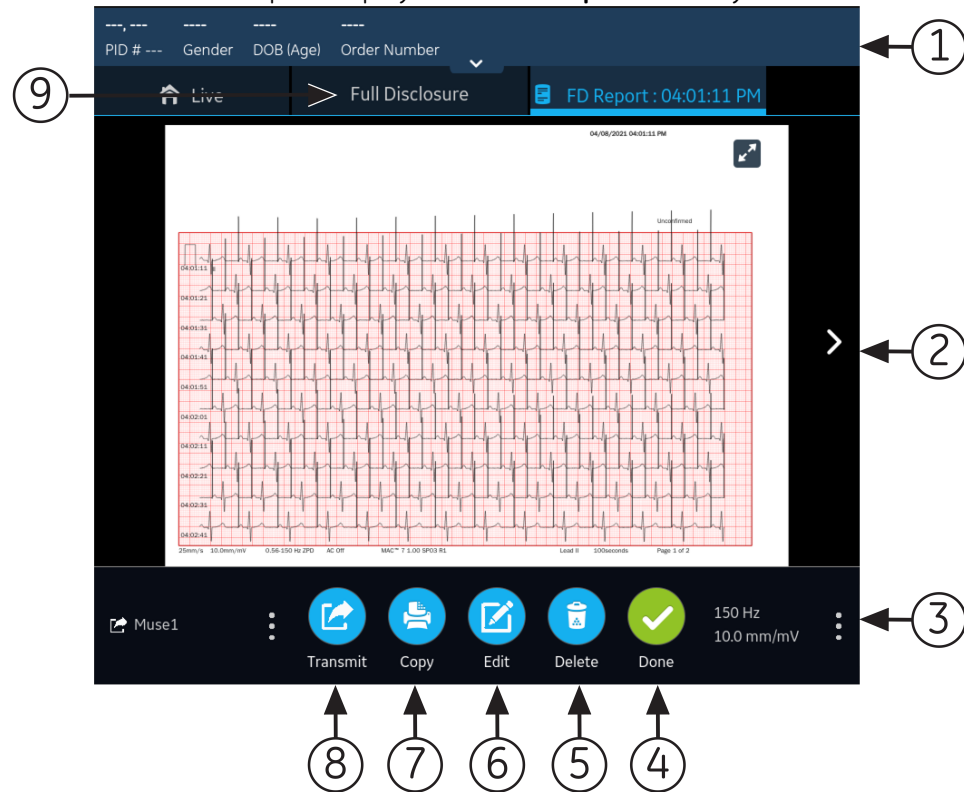


Table 18: Full Disclosure Report Tab

Item	Name	Description
1	Patient Information Banner	The information that displays on the screen for the patient such as first name, last name, gender, age, and so on. To edit the patient information, click anywhere on the Patient Information screen.

<i>Item</i>	<i>Name</i>	<i>Description</i>
2	Full Disclosure Report	<p>Displays the Full Disclosure report. If a Full Disclosure report contains more than one pages, click the left and right arrows on the screen to see the next page.</p> <p>When you record Full Disclosure ECG:</p> <ul style="list-style-type: none"> • If the acquisition module is disconnected, the Full Disclosure report displays empty space on the screen. • If the lead is disconnected or the ECG waveform does not display, the Full Disclosure report displays a straight horizontal line on the screen, and transforms into square waves on the printed or transmitted FD Report. <p>NOTE: Only a FD Report or Rhythm Report can have a single tab. The ECG report will always have a tab, but if you enable a Rhythm tab and select a FD Report, the Rhythm tab will be replaced by the FD tab.</p>
3	Gain, Filter, and Speed	<p>To edit the gain, filter, or speed of the waveform in the report, do the steps as follow:</p> <ul style="list-style-type: none"> • Click the ellipsis icon that is on the lower right of the FD Report tab. • Select a new value from the expanded list. • The Full Disclosure report refreshes with the selected gain, filter, and speed.
4	Done icon	Closes the Full Disclosure report. For more information, see Close a Patient Report on page 63 .
5	Delete icon	Deletes the Full Disclosure report. For more information, see Delete a Patient Report on page 62 .
6	Edit icon	Edits the patient information for the Full Disclosure report. For more information, see Edit Patient Information in a Patient Report on page 62 .
7	Copy icon	Prints a copy of the Full Disclosure report. For more information, see Print a Patient Report on page 60 .
8	Transmit icon	Transmits the Full Disclosure report. For more information, see Transmit a Patient Report to a Configured Destination on page 57 .
9	Full Disclosure tab	Click the Full Disclosure tab to navigate to the Full Disclosure waveform and application.

To start a new Full Disclosure report for the same patient, click the **Full Disclosure** tab to navigate to the Full Disclosure waveform and application, and restart the Full Disclosure ECG. For more information, see [Record a Full Disclosure ECG on page 64](#).

5

Work with Orders

Make sure that the ORDM option is enabled on the device. Contact a GE Healthcare Service Support representative to enable this option.

If order management is enabled, the **Orders** list displays in the Acquisition screen. You can retrieve orders from an order management server (such as a MUSE system) that is connected to your network.

When the orders list is updated, either automatically or manually, new orders are populated in the list.

The figure illustrates the **Orders** collapsed list:

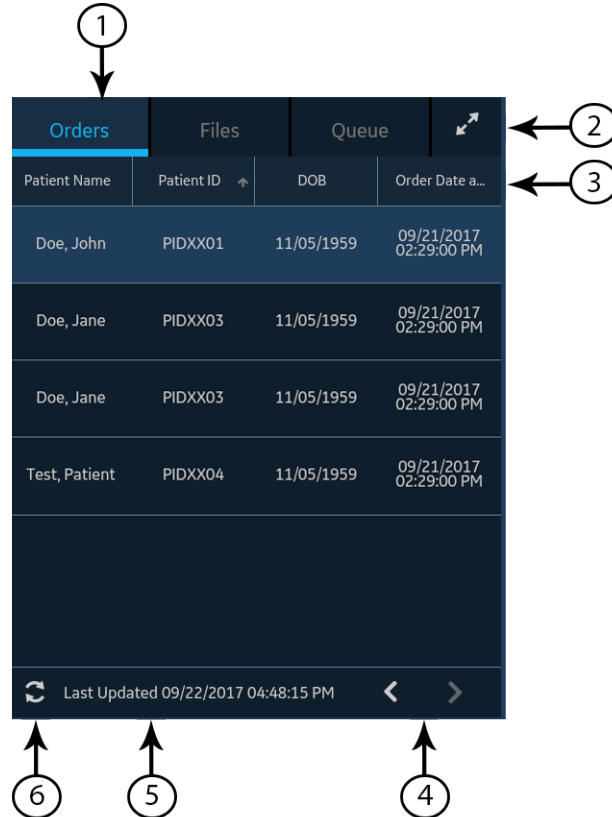


Table 19: Orders Collapsed List

Item	Name	Description
1	Orders tab	Displays a list of orders downloaded from an order management server. A filter icon next to the tab name indicates that the order list is filtered by a location.
2	Expand icon	Opens the Orders expanded list.
3	Orders collapsed list columns	Displays up to four configurable columns that provide information about the orders. This view will include at least one of the columns: Patient Name, Patient ID, or Visit Number.
4	Navigation arrows	Navigates to the previous and next pages in the Orders list.
5	Last Updated date and time	Displays the date and time the order list was last updated.
6	Refresh icon	Downloads the list of orders.

The figure illustrates the **Orders** expanded list:

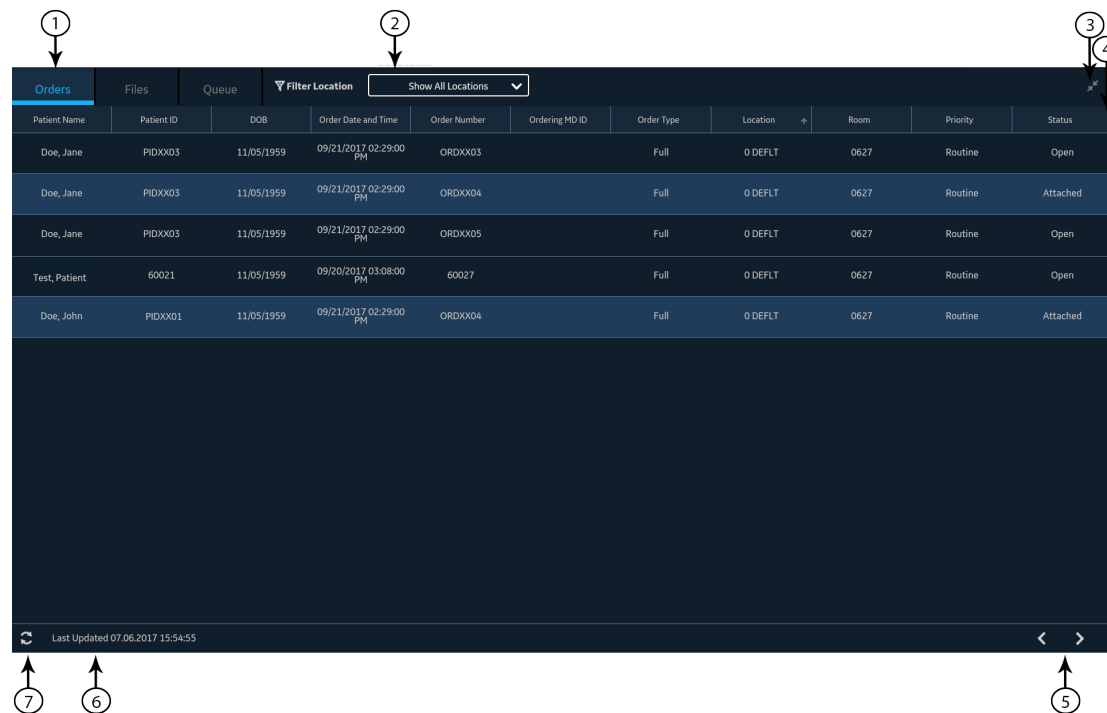


Table 20: Orders Expanded List

Item	Name	Description
1	Orders tab	Displays the Orders expanded list. A filter icon next to the tab name indicates that the order list is filtered by a location.
2	Filter Location list	Select anywhere on the Filter Location field. From the drop-down menu, select the location filter you want to apply to the orders list.

<i>Item</i>	<i>Name</i>	<i>Description</i>
3	Collapse icon	Collapses the Orders list.
4	Orders expanded list columns	Displays up to eleven configurable columns that provide information about the orders.
5	Navigation arrows	Navigates to the previous and next pages in the Orders list.
6	Last Updated date and time	Displays the date and time the order list was last updated.
7	Refresh icon	Downloads the list of orders.

Only one order can be associated with a patient test at any given time.

Only 12-lead order can be displayed on the device.

Orders cannot be attached to:

- Transmitted patient reports, or
- Digital Rhythm patient reports.

If you do not have permissions to edit patient reports, you cannot attach an order to the patient report.

When an order is attached to a patient test, all fields are read-only except for which can be edited below:

- **Blood Pressure**
- **Room Number**
- **Bed Number**
- **Test Indication**
- **Priority**
- **Comments**
- **Technician**
- **Patient History**
- **Location**
- **<Question>**
- **Attending MD ID**
- **Attending MD First Name**
- **Attending MD Last Name**

WARNING:

INACCURATE PATIENT DATA - Incorrect patient information can cause patient data mismatch. Data assigned to the wrong patient causes erroneous patient data that can affect diagnosis and treatment.

Be sure to check the patient information screen for each new patient. Make sure that you attach the correct order for the correct patient.

Automatically Update the Orders List

The auto-update option must be enabled by your administrator to automatically update orders from the order management server. Orders are automatically updated when:

- The device is powered on.
- A user logs into the device or unlocks the device.
- The **Start New Patient** button is selected.
- A report is successfully sent to a remote device over the network.

The **Last Updated** date and time is updated. No error messages display if orders are not being automatically updated. You can also manually update the **Orders** list.

Manually Update the Orders List

You can manually update the orders list at any time, even if the auto-update option is enabled.

1. From the Acquisition screen, select the **Orders** tab.
The **Orders** collapsed list opens.
2. Select the **Refresh** icon to update the orders list .



The list of orders is refreshed and updated with the latest information. All previous data is overwritten. The date and time when the list was last updated display next to the **Refresh** icon.

If the device is not connected to the network, a message displays in the notification area indicating that the update has failed because the device is not connected to the network. If the message persists, contact your administrator to resolve the network issue.

If the device fails to connect to the order management server, a message displays in the notification area indicating that the update has failed because the connection to the order management server could not be established. If the message persists, contact your administrator.

You can download a maximum of 1000 orders. If the number of orders exceeds this limit, an error message displays asking you to restrict the order download filter.

Sort Orders in the Orders List

By default, the **Orders** list is sorted in descending order by the **Location** column, if the **Location** column is configured as one of the display columns.

If the **Location** column is not configured to display in the **Orders** list, the list is sorted in descending order by the column configured to display as the first column.

If you select the **Priority** column header or if the **Priority** column is the first column, the orders list is sorted in the order of priority:

- STAT
- ASAP
- Pre-Op
- Call back
- Routine

If you select the **Priority** column again, the sorting order is reversed.

You can change the sort order by selecting any one of the column headers. The orders list is sorted in ascending order by the selected column. If you select the same column header again, the orders list is sorted in the reverse order. If you select another column header, the orders list is sorted in ascending order by that column.

Changes made to the sort order apply until you log out or shutdown the device.

Filter Orders in the Orders List



The **Orders** list is filtered by **Show All Locations**, **Current Patient Location**, or 1 out of 10 pre-configured filter groups. All of the order lists display based on the location filter you apply.

1. From the Acquisition screen, select the **Orders** tab.
The **Orders** collapsed list opens.



2. Select the necessary filter location from the drop-down list.



The order list refreshes and displays only the locations in the selected filter. If you select the filter drop-down list, the filter icon changes to . If you apply a location filter in the **Orders** list, the filter icon changes to  to indicate that the order list is filtered and does not display all orders.

If you select...	Then...
A pre-configured filter group	The orders list displays orders from the locations in the selected filter group.

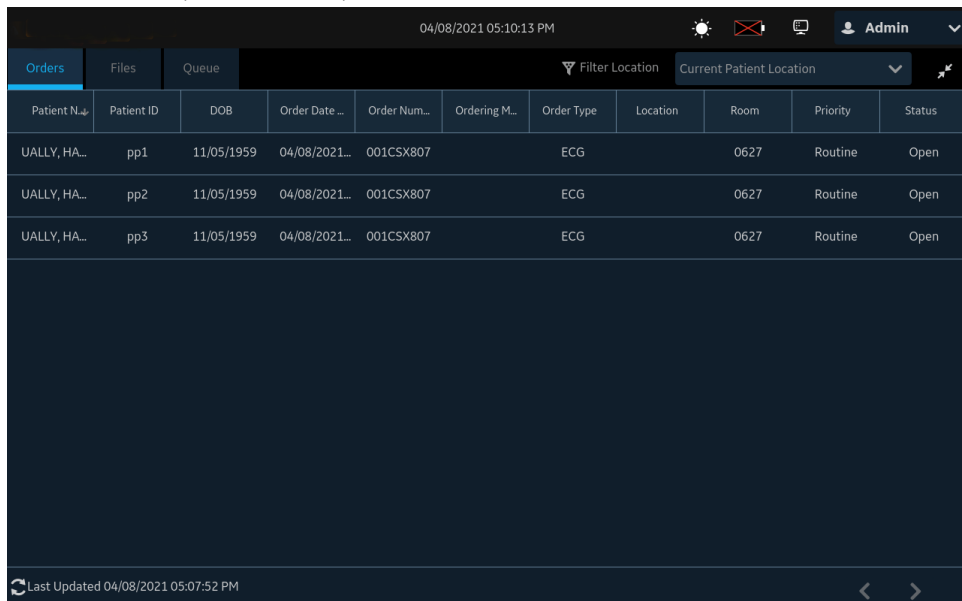
<i>If you select...</i>	<i>Then...</i>
The Current Patient Location	The orders list displays only the orders from the current location of the device configured in the device settings.
The Show All Locations	The orders list displays the orders from all the locations of the device configured in the device settings.




- To display an expanded list of **Orders**, select the **Expand** icon.



The **Orders** expanded list opens.



By default, the applied filter is **Current Patient Location**

, and displays all orders from the current location of the device.

Attach an Order when the Patient Test is Not Started

1. Start a test for the new patient. For more information, see [Start a Test for a New Patient on page 28](#).
2. Double-tap the order in the **Orders** list to attach it to a patient test. The order number and other details available in the order are populated in the patient test record and the **Patient Information** screen is automatically expanded.
3. Edit patient information and select **Save** to save the patient data.
4. Record the ECG. For more information, see [Manually Start an ECG recording on page 45](#).
5. Verify that the status of the order in the **Orders** list is **Attached**.

Attach an Order to a New Patient Test

NOTE:

You cannot attach an order that is already attached to another test. You must first detach the order. See [Detach an Order from a Patient Test on page 78](#).

1. Start a test for the new patient. For more information, see [Start a Test for a New Patient on page 28](#).
2. Double-tap the order in the **Orders** list to attach it to the current patient test.

<i>If</i>	<i>Then</i>
You did not manually enter patient data in the Patient Information screen after starting the test	There is no data mismatch upon attaching the order. Therefore, the order number and other details available in the order are populated in the patient test record and the Patient Information screen is automatically expanded. The status of the order is changed to Attached . Go to step 4 .

<i>If</i>	<i>Then</i>
You manually entered patient data in the Patient Information screen after starting the test	There is a data mismatch between the order data and the manually entered patient data. A warning message displays indicating a mismatch in the patient name or patient ID and asks you to confirm that the selected order can be attached to the patient test, overwriting existing patient data. Go to the step 3 .

3. Select **Yes** to overwrite the patient information with data from the order. The order is attached to the patient report.
 - All patient demographic fields included in the order are populated in the test, overwriting the existing patient data.
 - The status of the order is changed to **Attached**.
4. Update test demographics in the **Patient Information** screen and select **Save**. For more information, see [Enter or Edit Patient Information Using the Software Keyboard on page 36](#).
5. Record the ECG. For more information, see [Manually Start an ECG recording on page 45](#).

Attach an Order when the Patient Test is Completed

NOTE:

You cannot attach an order that is already attached to another test. You must first detach the order. See [Detach an Order from a Patient Test on page 78](#).

1. From the **Files** list, open the stored patient report.
2. Double-tap the order in the **Orders** list to attach it to the current patient test.

<i>If</i>	<i>Then</i>
You did not manually enter patient data in the Patient Information screen after starting the test	There is no data mismatch, but a message displays asking you to confirm that the selected order can be attached to the patient test, overwriting existing patient data. Go to step 3 .

<i>If</i>	<i>Then</i>
You manually entered patient data in the Patient Information screen after starting the test	There is a data mismatch between the order data and the manually entered patient data. A warning message displays indicating a mismatch in the patient name or patient ID and asks you to confirm that the selected order can be attached to the patient test, overwriting existing patient data. Go to the step 3 .

3. Select **Yes** to update the patient information with data from the order. The order is attached to the patient report.
 - All patient demographic fields included in the order are populated in the test, overwriting the existing patient data.
 - The status of the order is changed to **Attached**.
4. Update test demographics in the **Patient Information** screen and select **Save**. For more information, see [Enter or Edit Patient Information Using the Software Keyboard on page 36](#).

Attach an Order that is Attached to a Different Patient Test

NOTE:

Only one patient test can be associated with an order at any given time, regardless of the status of the patient test.

1. Start a new patient test.
2. Double-tap an order attached to a patient test in the **Orders** list.
A message displays indicating that the order is already attached to a patient test.
3. Perform one of the actions below:
 - Select **Detach** to detach the order from the existing patient test and attach the order to the new patient test.

<i>If</i>	<i>Then</i>
The patient test the order is attached to is already transmitted to its default destination	The order cannot be removed from this test. A message displays indicating that the patient test has been transmitted to the default destination and the order cannot be detached. Select OK .
If the patient test is not transmitted	A message displays notifying you that the order will be detached from the patient test. Go to step 4 .

- Select **View Test** to open the patient test and view it as if the test had been opened from the **Files** list.
4. Select **Continue** to detach the order from the existing patient test and attach the order to the new patient test.

Change the Order Attached to a Patient Test

If an incorrect order is attached to a patient test, use below procedure to detach the order from the patient test and replace it with a different order.

Before you start this procedure, make sure that the patient test is not already transmitted to its default destination. If the test has the **Sent** status of **Yes** (for example, the test was already sent to its default destination), the order can no longer be detached from the test. A message displays indicating that the patient test has been transmitted and the order cannot be detached.

WARNING:

INACCURATE PATIENT DATA - Incorrect patient information can cause patient data mismatch. Data assigned to the wrong patient causes erroneous patient data that can affect diagnosis and treatment.

Be sure to check the patient information screen for each new patient. Make sure that you attach the correct order for the correct patient.

1. Detach the incorrect order from the patient test. See [Detach an Order from a Patient Test on page 78](#).
2. Attach the correct order to the patient test. See [Attach an Order when the Patient Test is Completed on page 76](#).

Detach an Order from a Patient Test

Before you start this procedure, make sure that the patient test with the incorrect order has not been transmitted to its default destination.

NOTE:

If the patient test to which the order is attached has been transmitted to its default destination, the order cannot be detached from the test. A message displays indicating that the patient test has been transmitted and the order cannot be detached.

1. From the **Files** list, select the patient report with the incorrect order that you want to detach.
The patient report displays in the **ECG** tab.
2. Expand the **Patient Information** screen and scroll down to the **Order Number** field.
3. Select **Detach** next to the **Order Number** field to clear the field.

A message displays asking you to confirm if you want to detach the order from the selected test.

4. Select **Yes** to detach the order from the current test.
The order number field is cleared.
5. Select **Save** to save your changes.
The order is detached from the patient test and moves back to the **Open** status.

Order Status

Each order in the **Orders** list has one of the states below:

- Open
- Pending
- Attached

When an order is downloaded from the order management server, the status of the order can be **Open** or **Pending**. After an ECG has been acquired for an order, or an order has been attached to an existing ECG patient report, the order is moved to the **Attached** state in the **Orders** list.

The table describes various order status changes:

<i>If...</i>	<i>Then...</i>
You add an order to a patient test from the Orders list	<ul style="list-style-type: none"> • The order status changes from Open to Attached. • The MUSE server is notified to change the status of the corresponding order on the MUSE system from Open to Pending, if the device is connected to the network. If the attempt to notify the MUSE server fails, the status remains as Open.
The order number is detached from a patient test before acquiring the ECG	<p>The order status changes from Attached to Open.</p> <p>The order status changes from Pending to Open on the MUSE server.</p>
An order attached to an acquired, but untransmitted ECG patient test, is detached	<p>The order status changes from Attached to Open.</p> <p>The order status changes from Pending to Open on the MUSE server.</p>

When the order list is updated, the orders attached to completed ECG patient reports transmitted to the MUSE server are cleared from the **Orders** list, and new orders are downloaded from the MUSE server.

NOTE:

The **Attached** order status is not included in the transmitted patient reports.

6

Work with the Files List

The **Files** list displays stored digital rhythm and ECG patient reports. The figure illustrates the **Files** collapsed list:

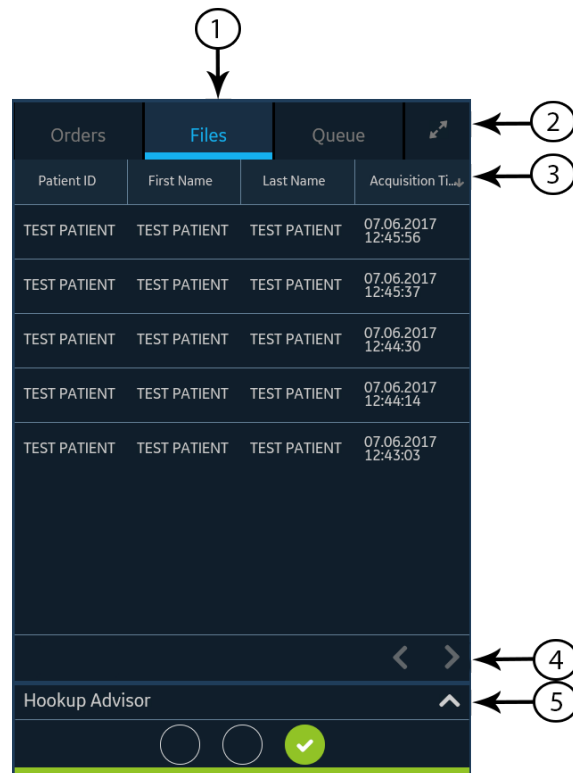


Table 21: Files Collapsed List

<i>Item</i>	<i>Name</i>	<i>Description</i>
1	Files tab	Opens the Files collapsed list that stores the saved patient reports.
2	Expand icon	Opens the Files expanded list.
3	Files collapsed list columns	Displays columns that provide information about the stored patient reports.

Item	Name	Description
4	Navigation arrows	Navigates to the previous and next page in the Files list.
5	Expand arrow	Expands the Hookup Advisor electrode placement image. When expanded, the image overlays the Files list.

The figure illustrates the **Files** expanded list:

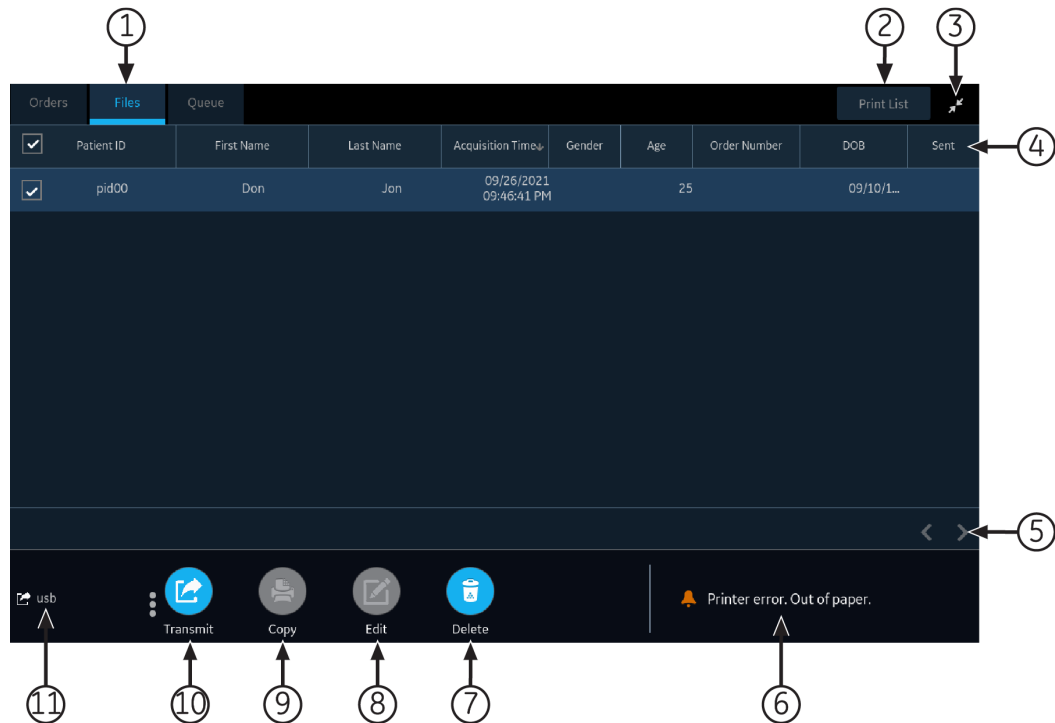


Table 22: Files Expanded List

Item	Name	Description
1	Files tab	Opens the Files expanded list that stores the saved patient reports.
2	Print List	Prints the stored records from the Files list. This button is enabled only if the stored records are available.
3	Collapse icon	Collapses the Files list.
4	Files expanded list columns	Displays columns that provide information about the stored patient reports.
5	Navigation arrows	Navigates to the previous and next pages in the Files list.
6	Notification status	Shows the progress, error, or successful messages.
7	Delete icon	Deletes the selected patient reports.

<i>Item</i>	<i>Name</i>	<i>Description</i>
8	Edit icon	Edits patient information for the selected patient report.
9	Copy icon	Prints a copy of the selected patient reports.
10	Transmit icon	Transmits the patient reports to the selected destination.
11	Destination menu	

Review a Stored Patient Report

Make sure that you have the privilege to view Rhythm, Full Disclosure, or ECG patient reports in the **Files** list. If you do not have the privilege, you can only view the patient reports you created in the current session.

- From the Acquisition screen, select the **Files** tab.
The **Files** collapsed list opens.
- Select the Rhythm or Full Disclosure or ECG patient report that you want to view.
An ECG patient report opens in an **ECG** tab.
A Rhythm report opens in a **Rhythm** tab.
A Full Disclosure report opens in a **FD Report** tab.
- Review and make necessary changes to the patient report, before printing a copy of the report or transmitting the report to a configured destination.

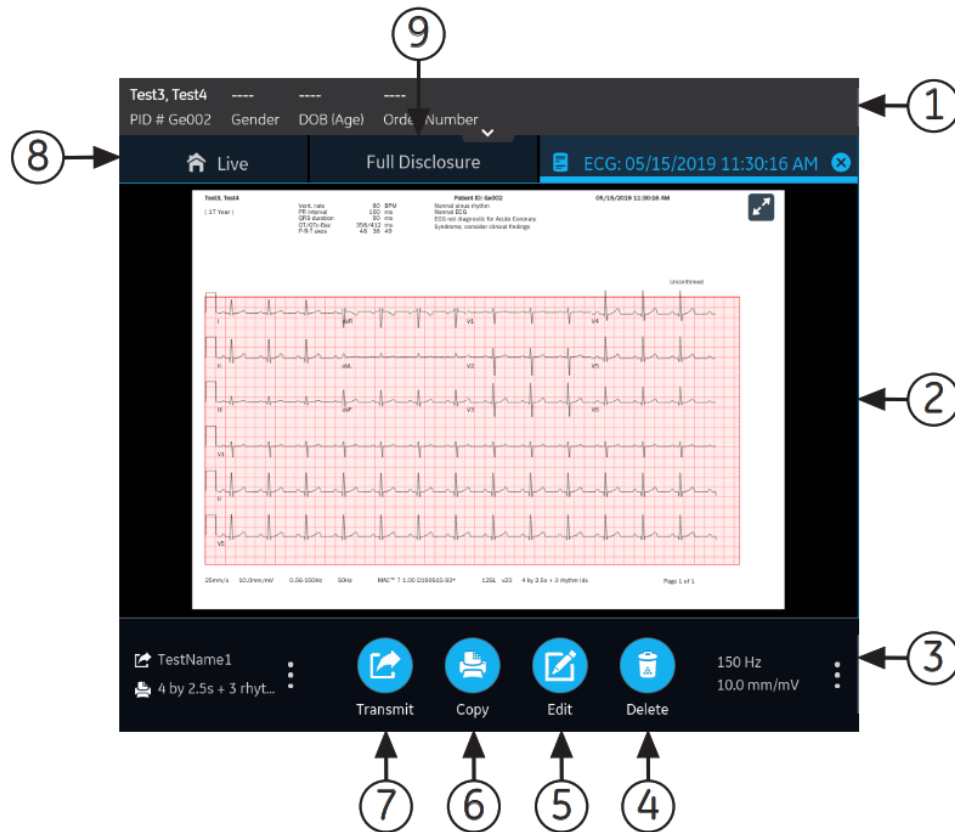


Table 23: ECG, FD Report, or Rhythm Tab Displaying a Stored Patient Report

Item	Name	Description
1	Patient Information Banner	Displays patient information. A grey banner indicates the patient report has been stored in the device. Select anywhere in the banner to expand the screen and edit patient information.
2	ECG patient report, Rhythm report, or Full Disclosure report	Displays the patient report. For more information on the report formats, see ECG Report Formats on page 123 and Rhythm Report Format on page 128 .
3	Gain, Filter, and Speed	Allows you to change the waveform gain, filter or speed. Select anywhere around the ellipsis icon next to Gain , Filter or Speed and select a value from the gain, filter, or speed options in the menu. The patient report is refreshed with the selected configurations. NOTE: The Speed option displays only for the rhythm reports.
4	Delete icon	Select the Delete icon to delete the patient report from the Files list. Deleting the patient report closes the current tab and displays the Live tab. For more information, see Delete Stored Patient Reports from the Files List on page 91 .

<i>Item</i>	<i>Name</i>	<i>Description</i>
5	Edit icon	Select the Edit icon to expand the Patient Information screen and edit patient information for the patient report. For more information, see Edit Patient Information in a Stored Patient Report on page 90 .
6	Copy icon	Select the Copy icon to print a copy of the patient report in the default report format. For more information on printing a copy of the report, see Print a Stored Patient Report on page 88 .
7	Transmit icon	Select the Transmit icon to transmit the patient report to the default destination. For more information, see Transmit a Stored Patient Report to a Configured Destination on page 85 .
8	Live tab	Select the Live tab to close the opened stored patient report tab and return to the live waveform display in the Acquisition screen. The Patient Information banner displays the demographics of the current active patient.
9	Full Disclosure tab	Select the Full Disclosure tab to close the opened stored patient report tab and navigate to the Full Disclosure waveform and application. The Patient Information banner displays the demographics of the active patient.

4. Select  to close the tab.

Transmit a Stored Patient Report to a Configured Destination


- Make sure that you have the privilege to transmit patient reports to a configured destination.
- Select the correct destination for your patient report.

<i>Patient Report Type</i>	<i>Destination</i>	<i>Supported File Format</i>
Resting ECG	DCP server destination (MUSE v8 SP3 or higher, v9, or MUSE NX and MUSE DICOM Gateway Pro SP1 or higher)	Hilltop format
Resting ECG	USB R/W flash drive	PDF, Hilltop and Sapphire XML (Sapphire XML format is available if you enable the XML format output in the Option Manager) formats.
Resting ECG	SFTP server destination with remote directory path	PDF, Hilltop and Sapphire XML (Sapphire XML format is available if you enable the XML format output in the Option Manager) formats.
Resting ECG	Shared directory destination with folder path	PDF, Hilltop and Sapphire XML (Sapphire XML format is available if you enable the XML format output in the Option Manager) formats.



<i>Patient Report Type</i>	<i>Destination</i>	<i>Supported File Format</i>
Digital Rhythm	USB R/W flash drive	PDF format
Digital Rhythm	DCP server destination (MUSE v9 SP6 or higher, or MUSE NX and MUSE DICOM Gateway Pro SP6 or higher)	PDF format
Digital Rhythm	SFTP server destination with remote directory path	PDF format
Digital Rhythm	Shared directory destination with folder path	PDF format
Full Disclosure	USB R/W flash drive	PDF format
Full Disclosure	DCP server destination (MUSE v9 SP6 or higher, or MUSE NX and MUSE DICOM Gateway Pro SP6 or higher)	PDF format
Full Disclosure	SFTP server destination with remote directory path	PDF format
Full Disclosure	Shared directory destination with folder path	PDF format

To transmit a patient report to the default or configured destination, perform the steps below:

1. From the Acquisition screen, select **Files**.
The **Files** collapsed list opens.
2. Perform one of the steps below:

<i>If</i>	<i>Then</i>
You want to transmit one patient report	Select the Rhythm or Full Disclosure report or ECG patient report you want to transmit to a configured destination. The selected patient report opens in a new tab (ECG or FD Report or Rhythm tab), depending on the report type.
You want to transmit multiple patient reports	Select the Expand icon to expand the Files list, and select the check box next to the patient reports to be transmitted. 

3. Perform one of the steps below:

<i>To transmit the report(s) ...</i>	<i>Perform the following:</i>
To the default destination	Select the Transmit icon: 
To another configured destination	<ol style="list-style-type: none"> 1. Select anywhere around the ellipsis icon on the lower, left-side of the screen to expand the Transmit menu. 2. From the expanded Transmit menu, select any configured destination to transmit the patient report(s). 3. Select the Transmit icon:  <p>One or more destinations must be configured for the Transmit icon to be enabled. If no destinations are configured, the Transmit icon is disabled.</p>

The selected patient reports are added to the **Queue**, processed and transmitted to the selected destination. The **Job Status** can be viewed in the **Queue**. See [Display the Report Queue on page 95](#).

If you select patient reports for transmission from the expanded **Files** list, the message displays on the notification area in the lower, right-side of the screen: **<Count> reports added to the queue**, where **<Count>** is the number of selected reports.

If you select patient reports for transmission from the collapsed **Files** list, the message displays on the notification area in the lower, right-side of the screen: **<Destination_Name>: <Job_Status>**.

For example, if the destination name is USB, and the job status is **Failed**, the status displays as follows: **USB: Failed**.

A tick mark displays in the **Sent** column of the **Files** expanded list for patient reports successfully transmitted to the default destination.

<i>If</i>	<i>Then</i>
The transmission queue has reached its maximum limit of 1,000 reports, a message displays in the notification area that the transmission queue is full and no additional reports can be added.	Wait for the reports in the queue to transmit and try again.

<i>If</i>	<i>Then</i>
One or more patient reports have been transmitted to the selected destination, a message displays in the notification asking you to confirm if you want to re-transmit the already transmitted reports.	Perform one of the actions below: <ul style="list-style-type: none"> • Select OK to re-transmit the patient report. • Select Cancel to cancel the report transmission.
Patient information is incomplete in one or more patient reports selected for transmission (for example, required fields are blank or contain invalid data), a message displays in the notification area indicating that one or patient reports cannot be transmitted because of incomplete patient data.	Perform the steps below: <ol style="list-style-type: none"> 1. Edit the incomplete patient report to enter missing patient data. 2. Retry transmission.

Print a Stored Patient Report

You can print a copy of a stored ECG patient report in any configured report format for the selected lead set.

1. From the Acquisition screen, select the **Files** list.

The **Files** collapsed list opens. You can also select the **Expand** icon to open the **Files** expanded list:



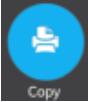
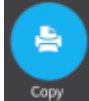
<i>If</i>	<i>Then</i>
You are in the Files collapsed list	Select the patient report for which you want to print a copy. The patient report opens in a new tab next to the Live tab. <ul style="list-style-type: none"> • If the selected report is an ECG patient report, it opens in an ECG tab. • If the selected report is a rhythm report, it opens in a Rhythm tab. • If the selected report is a Full Disclosure report, it opens in a FD Report tab.
You are in the Files expanded list	Select the check box next to the patient report for which you want to print a copy.

2. Select the Rhythm or Full Disclosure or ECG patient report for which you want to print a copy.

The selected patient report opens in a new tab.

- An ECG patient report displays in the **ECG** tab.
- A Rhythm report displays in the **Rhythm** tab.

- A Full Disclosure report displays in the **FD Report** tab.
3. Before printing a copy of the report, review the patient report and verify:
 - The patient information in the patient report is correct.
 - The ECG, Full Disclosure, or Rhythm test is acquired with the desired gain and filter.
 4. Perform one of the steps below:

<i>To print a copy of the patient report ...</i>	<i>Perform the following:</i>
In the default or selected report format displayed on the ECG or FD Report or Rhythm tab	<p>Select the Copy icon:</p>  <p>A job to print one copy of the patient report in the displayed report format is sent to the printer.</p>
In a different report format	<ol style="list-style-type: none"> 1. Select anywhere around the ellipsis in the left, bottom corner of the screen. 2. From the expanded Copy Format menu, select the report format. For example, if a 12-lead ECG is recorded, you can only select 12-lead ECG patient report formats. 3. Select the Copy icon:  <p>The patient report is refreshed and displayed on the ECG tab in the selected report format. A job to print one copy of the ECG or rhythm in the selected report format is sent to the printer.</p>

The patient report is printed in the order in which it was received. If no other patient reports are printing, the report is printed immediately. You will see a progress message at the bottom of the screen indicating the printing status.

NOTE:

Based on the **Mandatory fields apply for Acquisition** settings, the ECG report is not accepted, transmitted, or printed until you enter the patient demographic data for the mandatory fields. If you manually print, an error message **Unable to print. Incomplete patient data.** displays on the **Acquisition** screen. You need to complete the data for the mandatory fields to print the patient report.



If a printer error occurs, the progress message is replaced by the printer error. The printing restarts automatically after the error is resolved. For more information on printer errors, see [Printing Errors on page 116](#).

If the device is configured to print the barcode of the patient ID in the patient reports, the printed patient report includes the barcode. The barcode can be used to perform a query by patient ID in the MUSE system.

Select the **Stop** icon on the Report Printing screen to stop printing a patient report.

Print a List of Stored Records

You can print all the stored records that display in the **Files Manager**.

1. From the Acquisition screen, select the **Files** list.
The **Files** collapsed list opens.
2. Select the **Expand** icon  to open the **Files** list.
The **Files** expanded list opens.
3. Select the **Print List** button  to print the list of stored records.
The printing starts and a stop icon displays on the screen.

The stored record prints in the order in which it was displayed in the **Files Manager** view.

If a printer error occurs, the printer error message displays. Resolve the error and manually restart the print. For more information on printer errors, see [Table 30: Printing Errors Encountered During Printing of the List of Stored Records on page 117](#).

Select the **Stop** icon on the Report Printing screen to stop printing a patient report.

Edit Patient Information in a Stored Patient Report

Make sure that you have the privilege to open stored rhythm, Full Disclosure, or ECG patient reports from the **Files** list and edit patient information.

You can edit patient information using a software keyboard or by attaching an order, but not by scanning a patient barcode, selecting a patient record from the **Patients** list, or performing ADT queries. When an order is attached to a patient test, some fields are read-only.

If you try to edit or attach an order to a patient report that is transmitted to the default destination, an error message displays.

WARNING:

INACCURATE PATIENT DATA - Incorrect patient information can cause patient data mismatch. Data assigned to the wrong patient causes erroneous patient data that can affect diagnosis and treatment.

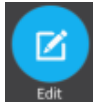
Be sure to check the patient information screen for each patient. Make sure that you enter patient data for the correct patient.

1. From the Acquisition screen, select **Files**.
The **Files** collapsed list opens. You can also select the **Expand** icon to open the **Files** expanded list:




<i>If</i>	<i>Then</i>
You are in the Files collapsed list	<p>Select the patient report for which you want to edit.</p> <p>The patient report opens in a new tab next to the Live tab.</p> <ul style="list-style-type: none"> • If the selected report is an ECG patient report, it opens in an ECG tab. • If the selected report is a rhythm report, it opens in a Rhythm tab. • If the selected report is a Full Disclosure report, it opens in a FD Report tab.
You are in the Files expanded list	Select the check box next to the patient report you want to edit.

2. Select the **Edit** icon to edit patient information for the stored patient report:



The **Patient Information** screen opens with a grey background indicating that this is a stored patient report.


3. Edit the patient information using a software keyboard. See [Enter or Edit Patient Information Using the Software Keyboard on page 36](#).
4. Select **Save** to save your changes for this patient and collapse the screen.
If you select any other icons at the bottom of the tab prior to saving, the **Patient Information** screen collapses and the edited patient information is saved.
The updated patient information displays on the patient report.
5. Select  to close the tab.

Delete Stored Patient Reports from the Files List

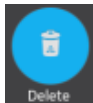
Make sure that you have the privilege to delete Rhythm, Full Disclosure, or ECG patient reports from the **Files** list.

If you do not have the privilege to view patient reports, but you have the privilege to delete patient reports, you can only view and delete patient reports you created in the current session.

1. From the Acquisition screen, select **Files**.
The **Files** collapsed list opens.
2. Perform one of the steps below:

<i>If</i>	<i>Then</i>
You want to delete one patient report	Select the Rhythm, Full Disclosure, or ECG patient report you want to delete. The selected patient report opens in a new tab (ECG or FD Report or Rhythm tab), depending on the report type.
You want to delete multiple patient reports	Select the Expand icon to expand the Files list, and select the check box next to the patient reports to be deleted. 

3. Select the **Delete** icon:



A message displays asking you to confirm if you want to permanently delete the selected patient report(s).

4. Select **Delete** to delete the patient reports.

The selected patient reports are deleted from the **Files** list.

An alert may be configured by your administrator to warn you before deletion of untransmitted reports.

If this alert is configured, and one or more patient reports you are trying to delete have not yet been transmitted to the default destination, a message displays asking you to confirm the deletion.

Perform one of the actions below:

- Select **Delete** to delete the selected patient reports. The selected patient reports are deleted from the **Files** list. If the patient report was opened for viewing on the Acquisition screen, deleting the patient report closes the tab, and returns you to the **Live** tab.
- Select **Cancel** to cancel the deletion. The selected patient reports are not deleted from the **Files** list.

7

Work with the Queue List

The digital rhythm, FD report and ECG patient reports transmitting to a designated location are temporarily stored in the **Queue** list.

The successfully transmitted digital rhythm, FD report and ECG patient reports are immediately deleted from the **Queue** list.

The figure illustrates the **Queue** collapsed list:

The screenshot shows a mobile application interface with a dark theme. At the top, there are three tabs: 'Orders', 'Files', and 'Queue'. The 'Queue' tab is selected and highlighted in blue. To the right of the tabs is a small icon of a square with an arrow pointing outwards. Below the tabs is a table with four columns: 'Acquisition D...', 'Job Status', 'Destination...', and 'Patient Name'. The 'Patient Name' column has a downward arrow next to it. There are two rows of data in the table, both showing 'Failed' status and 'USB' destination. At the bottom of the screen, there are two navigation arrows, a left arrow and a right arrow. Numbered callouts are present: 1 points to the 'Queue' tab, 2 points to the square icon, 3 points to the 'Patient Name' column header, and 4 points to the navigation arrows.

Acquisition D...	Job Status	Destination...	Patient Name ↓
07.06.2017 15:55:58	Failed	USB	TEST PATIENT, TEST PATIENT
07.06.2017 15:57:17	Failed	USB	TEST PATIENT, TEST PATIENT

Table 24: Queue Collapsed List

Item	Name	Description
1	Queue tab	Displays the list of patient reports in the transmission queue.
2	Expand icon	Opens the Queue expanded list.
3	Queue collapsed list columns	Displays columns that provide information about the patient reports in the transmission queue.
4	Navigation arrows	Navigates to the previous and next pages in the Queue list.

The figure illustrates the **Queue** expanded list:

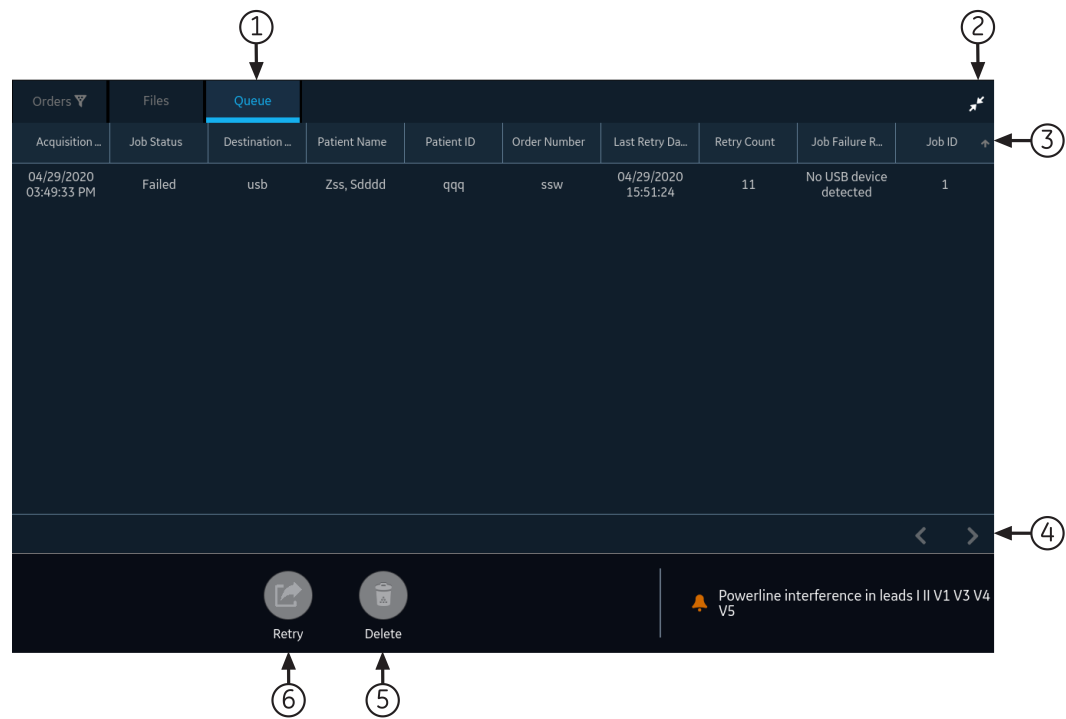


Table 25: Queue Expanded List

Item	Name	Description
1	Queue tab	Displays the list of patient reports in the transmission queue.
2	Collapse icon	Collapses the Queue list.
3	Queue expanded list columns	Displays columns that provide information about the patient reports in the transmission queue.
4	Navigation arrows	Navigates to the previous and next pages in the Queue list.
5	Delete icon	Deletes the selected transmission or network printing job from the Queue list.

Item	Name	Description
6	Retry icon	Retries the transmission of an unsuccessful job.

Table 26: Columns in the Queue List

Column Name	Description
Acquisition Date/Time	Displays the date and time of the rhythm, FD report or ECG patient report, in the configured date and time format.
Job Status	Displays the status of the job. Below statuses display: <ul style="list-style-type: none"> • In Progress: The job is currently being processed. • Failed: The transmission failed. The reason for failure is provided in the Job Failure Reason column. • Not Sent: The job is waiting to be processed. When the job is completed, the report is removed from the Queue list.
Destination Name	Displays the name of the configured destination.
Patient Name	Displays the name of the patient in the format First Name, Last Name .
Patient ID*	Displays the unique ID assigned to the patient.
Order Number*	Displays the order number.
Last Retry Date Time*	Displays the date and time of the last re-tried transmission, in the configured date and time format.
Retry Count*	Displays the re-tried transmission count in numbers. If the device sends the report on the first attempt, the Retry Count is 0.
Job Failure Reason*	Displays the reason for the failed transmission. If the device fails to transmit a report, contact your IT department. If the device sent the report successfully, this field is blank. To troubleshoot the errors, see Report Transmission Errors on page 119 .

Column names suffixed with an asterisk (*) in the table are visible only in the expanded **Queue** list.

Display the Report Queue

This procedure describes how to view the queue for the reports that are ready to be sent, were successfully sent, or failed in transmission.

NOTE:

For auto-transmitted reports, a message **Transmission complete x/y** displays in the notification area indicating that transmission is complete, where *x* is the current count of patient reports being transmitted, and *y* is the total count of reports being transmitted for the current patient.

1. From the Acquisition screen, select **Queue**.
The **Queue** collapsed list opens.
2. To open the **Queue** expanded list, select the **Expand** icon:



The **Queue** expanded list opens.

3. Select the **Collapse** icon to collapse the list and return to the Acquisition screen:



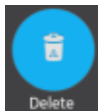
Delete Jobs from the Queue

1. From the Acquisition screen, select **Queue**.
The **Queue** collapsed list opens.
2. To display an expanded list of the **Queue**, select the **Expand** icon:



The **Queue** expanded list opens.

3. Select the transmission job you want to delete.
4. Select the **Delete** icon to delete the selected jobs:



- If the job status is **In Progress**, a message displays indicating that the job is in progress and cannot be deleted.

You cannot delete the job. Wait until the transmission attempt completes and then try again, if necessary.

- If the job is in **Not Sent** or **Failed** status, a message displays asking you to confirm the deletion of the selected job.

5. Select **Delete** to confirm the deletion.

The selected jobs are deleted from the **Queue**. The patient report remains in the **Files** list. You can transmit the patient report to a destination again, if required.

Retry Transmission of a Patient Report

Make sure that you have the privilege to transmit Rhythm, Full Disclosure, or ECG patient reports to a configured destination.

The system automatically tries to transmit a patient report. If you need to re-transmit the patient report before the next automatic attempt, you can use this procedure to transmit the patient report immediately.

1. From the Acquisition screen, select **Queue**.

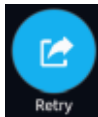
The **Queue** collapsed list opens.

2. To display the expanded list of the **Queue**, select the **Expand** icon:



The **Queue** expanded list opens.

3. Select one or multiple patient reports that you want to re-transmit and select the **Retry** icon:



If no other report transmission is in progress at the time, the selected patient report will be immediately transmitted. If another patient report is in the process of being transmitted, the selected patient report starts transmission as soon as the current patient report is transmitted.

If a patient report is successfully transmitted, it is immediately deleted from the **Queue**. Review the queue to confirm that the patient report was transmitted. All report transmissions are also logged in the **Report Transmission Log** in the **Service** screen.

If the patient report is not successfully transmitted (**Job Status** is **Failed**), the reason for the failure is listed in the **Job Failure Reason** field. You can try to re-transmit the report again.

4. Select the **Collapse** icon to close the **Queue** expanded list and return to the Acquisition screen:

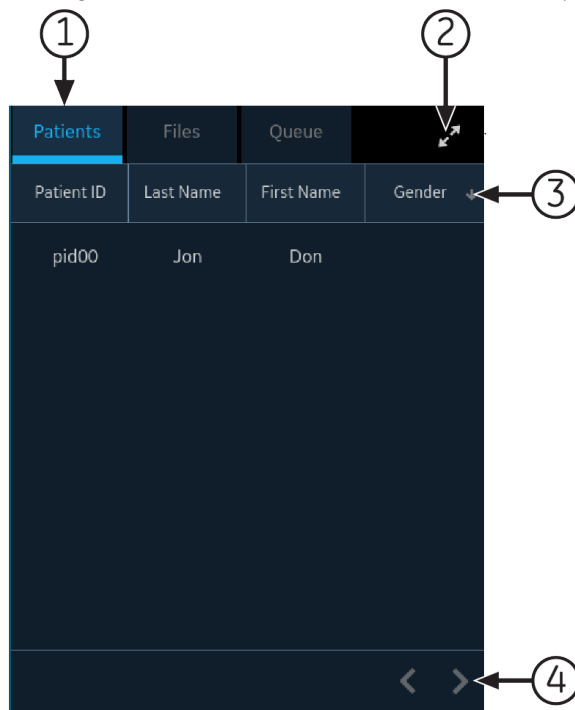


8

Work with the Patients List

If the **Order Manager** is disabled in the **Settings** screen, the **Patients** list displays in the Acquisition screen. The information of recent patients is stored in the **Patients** list, and you can view up to 500 recent patient information records.

The figure below illustrates the **Patients** collapsed list:



The figure below illustrates the **Patients** expanded list:

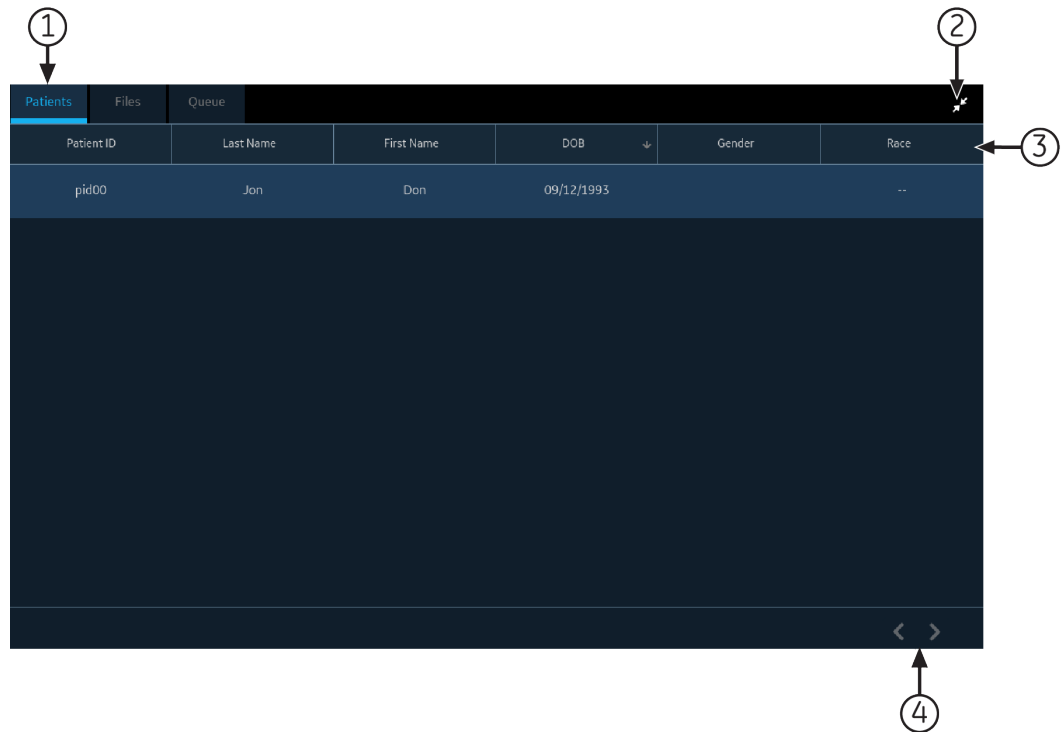


Table 27: Patients List

Item	Name	Description
1	Patients tab	Displays the Patients list.
2	Expand or Collapse icon	Expands or collapses the Patients list.
3	Patients collapsed and expanded list columns	<p>Displays these four columns in the collapsed list:</p> <ul style="list-style-type: none"> • Patient ID • Last Name • First Name • Gender <p>Displays these six columns in the expanded list:</p> <ul style="list-style-type: none"> • Patient ID • Last Name • First Name • DOB (Date of Birth) • Gender • Race <p>By default, the list is sorted by Last Name in ascending order. You can sort by any column by selecting the column header. Select the same column header again to sort in descending order.</p>

<i>Item</i>	<i>Name</i>	<i>Description</i>
4	Navigation arrows	Navigates to the previous and next pages in the Patients list.

Open the Patients List

The **Patients** list displays on the Acquisition screen if order management is disabled. Make sure that you have the privilege to view the patients lists or an error message will display when you try to view it.

1. From the Acquisition screen, select **Patients**.
The **Patients** collapsed list opens and displays a list of patients.
2. To display an expanded list of **Patients**, select the **Expand** icon:



The **Patients** expanded list opens.

Select a Patient from the Patients List

1. Select **Start New Patient**. For more information, see [Start a Test for a New Patient on page 28](#).
2. Select the **Patients** tab on the right-side of the Acquisition screen.
The **Patients** collapsed list opens and displays a list of patients.
3. Double-tap the patient record that you want to associate with the patient test.
If the desired patient record is not visible, select the navigation arrows to navigate to the previous and next pages of the **Patients** list and search for the patient record.
The patient data from the selected patient record is populated in the **Patient Information** banner and screen, and the screen expands.
4. Edit patient information in the fields. For more information, see [Enter or Edit Patient Information Using the Software Keyboard on page 36](#).

9

Maintenance

Adjust the Paper Tray for Paper Size

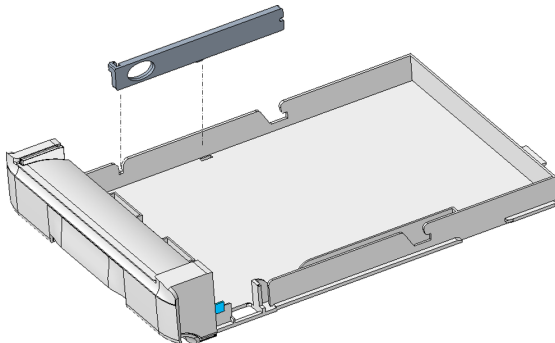
The printer supports the paper sizes:

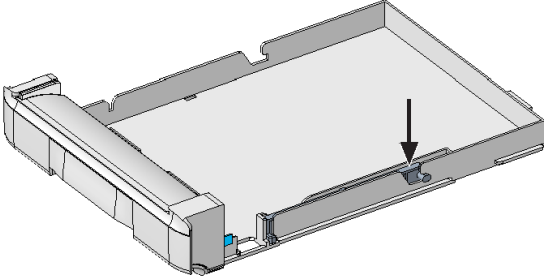
- A4 (8.27 x 11.7 inches) - 2104772-001
- Letter (8.4 x 11 inches) - 2104771-001

The paper tray is configured to use the appropriate paper size for the destination location. Use the instructions to change the paper size by moving the spacers in the paper tray.

1. Turn off the device.
2. Open the paper tray and remove the paper.
3. Press the center of the paper tray and pull it out.
4. Put the paper spacer in the tray.

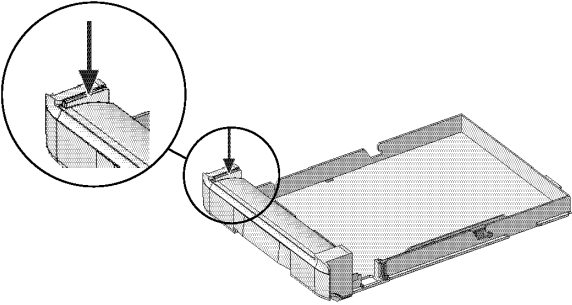
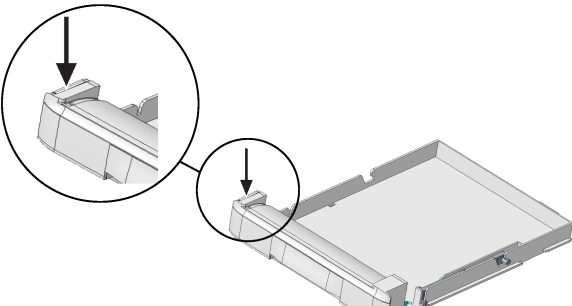
The paper spacer placement depends on the paper size.

<i>If the paper size is</i>	<i>Then</i>
A4	Put the paper spacer vertical along the left side of the paper tray. 

<i>If the paper size is</i>	<i>Then</i>
Modified letter	<p>Put the paper spacer horizontal across the rear of the paper tray:</p> 

Make sure that the spacer is aligned in the correct position. The tabs at the bottom of the spacer must fit into the Q holes on the bottom of the paper tray. The tabs on the two sides of the spacer are attached to the tab spaces on the paper tray.

- Put the outlet spacer in the paper tray.

<i>If the paper size is</i>	<i>Then</i>
A4	<p>Put the outlet spacer at the inside slot of the paper tray.</p> 
Modified letter	<p>Put the outlet spacer at the outside slot of the paper tray.</p> 

- Push the paper tray back to the printer assembly.

Store Thermal Paper

When imaged and stored properly, ECG tracings resist fading for several years. If your retention requirements exceed five years, consider using GE Archivist paper.

To make sure the tracing is imaged properly, the device must be maintained in accordance with its service and technical manuals.

To make sure the tracing lasts for the paper's expected life span, observe these guidelines when storing your printouts:

- Store in a cool, dark, and dry location.
 - Standard paper
 - Temperature must be less than 27°C (80°F).
 - Relative humidity must be less than 65%.
 - Archivist paper
 - Temperature must be less than 40°C (104°F).
 - Relative humidity must be between 40% and 60%.
- Avoid exposure to bright light or UV sources.
 - Sources of ultraviolet light include sunlight, fluorescent lights, halogen lights, mercury vapor lamps, and germicidal lamps.
- Avoid contact with cleaning liquids and solvents.
 - Solvents to avoid include alcohols, ketones, esters, ether, and so forth.
- Store thermal paper separately in manila folders or polyester or polyimide protectors.
 - Plastic document protectors, envelopes, or sheet separators made of polystyrene, polypropylene, or polyethylene do not degrade thermal traces. However, these materials afford no protection against fading from external causes.
- Do NOT store thermal papers with any of the cases below:
 - carbon or carbonless forms
 - document protectors, envelopes, and sheet separators containing polyvinyl chloride or other vinyl chlorides
 - non-thermal chart papers or any other products containing tributyl phosphate, dibutyl phthalate, or any other organic solvents

NOTE:

Many medical and industrial charts contain these chemicals.

- NOT use mounting forms, pressure-sensitive tapes, and labels that use solvent-based adhesives.

Use only mounting forms and pressure-sensitive tapes made with starch or water-based adhesives.

Clean the Printhead

If the printer does not function, you may need to clean dust and foreign particles from the printhead.

Use below procedure to clean the printhead:

1. Dip cotton swabs in ethyl alcohol and wring out the excess solution.

NOTE:

Do not use products that can harm the heating element, such as sandpaper.

2. Open the printer door.
3. Gently wipe the heating element with the cotton swabs.

NOTE:

- The printhead gets hot when recording. Do not touch the thermal printhead directly.
- Avoid unnecessary force when handling the printhead.

4. Re-insert the paper and close the printer door when the heating element is completely dry.

NOTE:

Use only original GE Healthcare writer paper. This paper has a special coating that prevents electrostatic buildup and contamination and debris collection on the printhead. Using other paper may result in recordings of poor quality. Use of other papers may wear out the printhead prematurely and may void the warranty.

Charge the Battery

You must charge the battery before initial use and in between acquisitions.

- To make sure a fully charged battery before initial use, charge the device before you use it for the first time.
- To make sure a fully charged battery in between acquisitions, power off the system and connect it to an AC wall outlet until you use the system again. This prolongs battery runtime.

The battery status indicator in the upper-right corner of the Acquisition screen shows how much charge the battery has available, and when the device is charging the battery. For more information on the battery status indicator, see [Battery Status on page 14](#).

- When the battery is charging, the color of the battery status indicator on the screen is green. The battery LED on the keyboard flashes the amber light at two-second intervals.
- When the battery is low or critically low, the color of the battery status indicator on the screen is red. If the total charge level drops below 15%, an error tone notifies

you and a message displays indicating that the battery is low. If the total charge level drops below 10%, the error tone is louder, longer, and sounds every minute, and a message displays indicating that the battery is critically low and you should connect to AC power immediately. The battery LED on the keyboard flashes the amber light at half-second intervals.

- When the battery is completely discharged, the device powers off. To operate your device, you must connect the system to an AC wall outlet. The battery LED on the keyboard turns off.
- If the battery is fully charged or exceeds safe charging temperature, the device will not charge the battery. The color of the battery status indicator on the screen is:
 - Green, if the device is connected to AC power.
 - White, if the device is not connected to AC power.

The battery LED on the keyboard turns off.

1. Power off the device.
2. Connect the system to an AC wall outlet.
3. Charge the battery for 3 hours or until the battery status indicator displays a full charge.

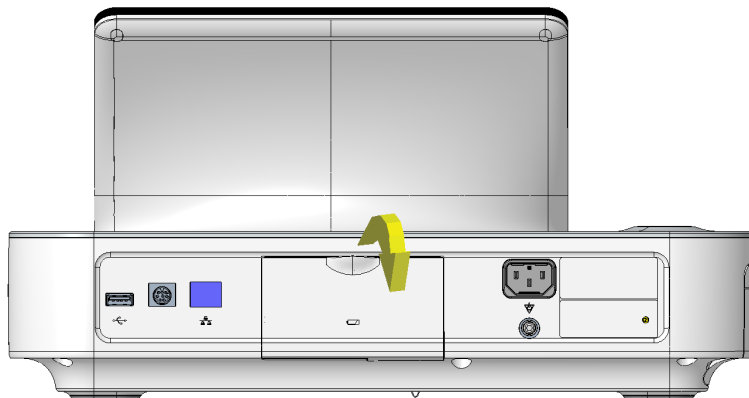
Replace the Battery

NOTICE:

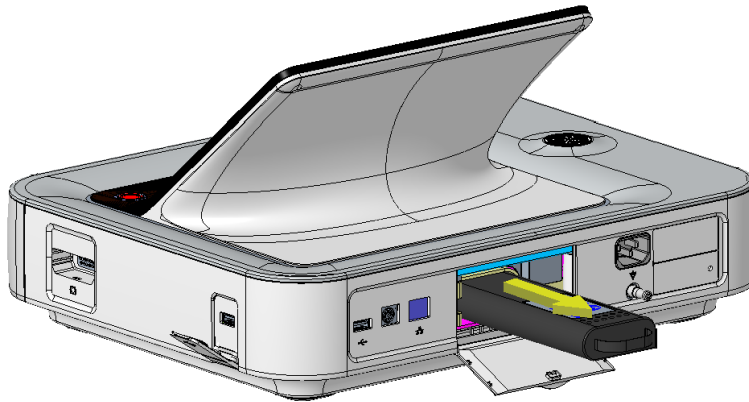
BATTERY PACK DISPOSAL

Do not dispose of the battery pack by fire or burning. Follow local environmental guidelines concerning disposal and recycling.

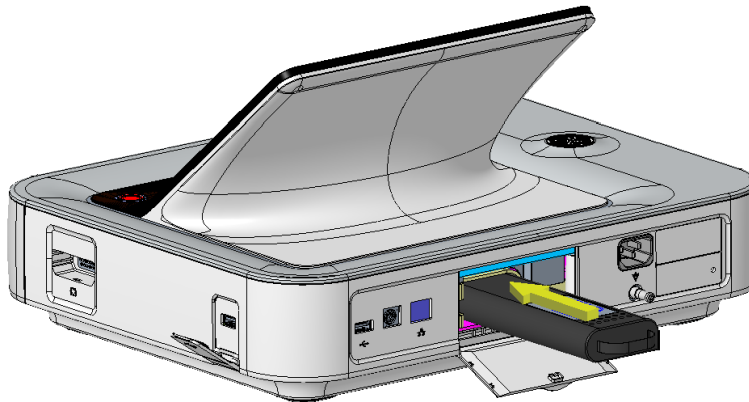
1. Place your thumb on the door release tab of the battery compartment door and gently pull it open. The arrow indicates the direction to pull the tab to open the door.



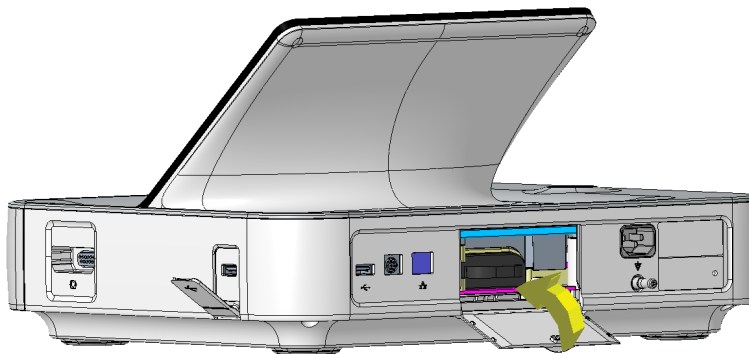
2. Press the latch beside the battery slot and pull the battery handle in horizontal direction to remove the battery.

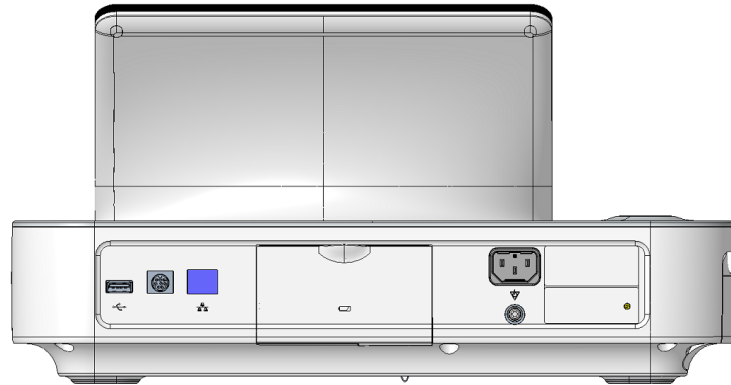


3. Slide the battery into the battery compartment slot in the correct orientation and direction indicated by the arrow.



4. Lift the battery compartment door in the upward direction and close it.





10

Cleaning and Disinfection

Inspect the Device

Carefully inspect devices between uses to verify proper function.

Evidence of damage and wear on a device may include but is not limited to discoloration, excessive scratches, wear, and cracks. Improperly functioning devices, damaged, and excessively worn devices should not be used.

Care at the Point of Use

Clean instruments as soon as possible after use.

Soiled devices must be separated from non-contaminated devices to avoid contamination of personnel or surroundings.

Preparation for Cleaning

For multi-piece or complex instruments, refer to their disassembly instructions. The disassembly instructions are available in the *MAC™ 7 Resting ECG Analysis System Service Manual*.

Contact your local GE Healthcare service representative for further information. For instruments produced by another manufacturer, reference the manufacturer's instructions for use.

Clean and Disinfect Guidelines

Observe the guidelines while cleaning and disinfecting the device.

- Follow cleaning instructions and observe hazards exactly as issued by GE Healthcare or other suppliers listed.
- Avoid exposure to hypochlorite solutions and solutions containing iodine or high chlorine content, as these will promote corrosion.

- Avoid exposure to highly alkaline conditions (pH > 11), as this can damage products (for example, aluminum parts).
- Never use conductive solutions or solutions that contain wax or wax compounds to clean the equipment.
- Do not immerse the device in any liquid as this may corrode metal contacts and affect signal quality.
- Do not drip or expose the writer assembly to any liquids.
- Do not allow fluid to pool around connection pins. If this happens, blot dry with a soft, lint-free cloth.
- Avoid contact with open vents, plugs, or connectors during the cleaning and disinfecting procedures.
- Never autoclave or steam-clean the device.
- Do not use until thoroughly dry.
- Do not use any of below materials to clean the device, because their use may damage equipment surfaces.
 - Organic solvents
 - Abrasive cleaners or solvents of any kind
 - Acetone
 - Ketone
 - Betadine
 - Sodium salts

Visual Inspection, Cleaning and Disinfection Frequency

The table indicates the frequency of visual inspection, cleaning, and disinfection procedures.

<i>Component</i>	<i>Visual Inspection</i>	<i>Cleaning</i>	<i>Disinfection</i>
Device and Trolley NOTE: Trolley is an optional purchase.	Daily, preferably before the equipment's first use each day	Monthly, or more frequently, as needed	Follow the same frequency as cleaning. Disinfection must be performed after cleaning.
Leadwires	Refer to the supplier's instructions for leadwire cleaning and disinfection.		
Reusable electrodes	Refer to the supplier's instructions for reusable electrode cleaning, disinfection and sterilization.		

Clean and Disinfect the Device and Trolley

If you purchase a trolley, the device and trolley are designed to require regular inspection and cleaning to function properly. The cleaning instructions for the device includes the touchscreen.

WARNING:

ELECTRICAL HAZARD - Improper handling during inspection or cleaning could result in electrical shock.

To avoid potential shock, observe the guidelines at all times:

Before inspecting or cleaning the device, turn it off, unplug it from AC power, and remove the battery.

Do not immerse any part of the equipment in water.

Pre-Clean Inspection and Functional Test

Perform a visual inspection to verify that the device meets the minimum conditions:

- The case and display screen are free of cracks and other damage.
- All plugs, cords, cables, and connectors are free of kinks, frays, and other damage.
- All cords and connectors are securely seated.
- All keys and controls operate properly.
- The trolley exterior is free of cracks and other damage.
- The accessory track is functioning properly.
- All cords and connectors are securely seated.
- The actuation lever is functioning properly.
- The castor wheels are functioning properly.

If you notice any items that need repair, contact an authorized service representative to make the repairs. Discontinue using the device until the appropriate repairs can be made.

Clean the Device and Trolley

1. Dispense Super Sani-Cloth® Wipe(s) from the canister.
2. If soil is present, thoroughly wipe the surfaces of the device with a fresh Super Sani-Cloth® Wipe for a minimum of two minutes and until soil and organic matter have been visibly removed.

Treated surfaces must remain visibly wet for a minimum of two minutes. Use additional fresh disinfectant wipes, if needed, to make sure continuous two minutes contact time. Pay attention to the recessed areas and ridges; use a cotton swab to press onto the wipe for scrubbing these areas.

3. Inspect the device and trolley to make sure the complete removal of soil from surfaces, holes, and moveable parts.
If soil is still present, re-clean the equipment by repeating step 2.
4. Allow the device to air dry.
5. Discard wipes to clinical waste.
Do not reuse wipes.

Post-Clean Inspection

GE Healthcare devices should be visually inspected and functionally tested after cleaning and prior to disinfection for below items:

- Cleanliness.
- Damage, including but not limited to corrosion (rust, pitting), discoloration, excessive scratches, flaking, cracks, and wear.
- Missing or worn part numbers.
- Proper functioning, including but not limited to the quality of ECGs; correct movement of hinges, joints, box locks, handles, ratchets, and couplings; proper alignment of jaws and teeth; and secure fastening of all locking mechanisms.

Do not use devices that are not functioning properly, that have unrecognizable markings, that have missing or worn part numbers, or that are damaged. Disassembled devices should be reassembled prior to disinfection unless otherwise instructed.

Disinfect the Device and Trolley

Make sure that cleaning is carried out to remove all visible soil and organic matter. See [Clean the Device and Trolley on page 110](#).

1. Dispense fresh Super Sani-Cloth[®] Wipe(s) from the canister.
2. Apply disinfectant to the entire surface using fresh wipes.
Treated surfaces must remain visibly wet for a minimum of three minutes. Use additional fresh disinfectant wipes, if needed, to make sure continuous three minutes contact time. Pay attention to the recessed areas and ridges; use a cotton swab to press onto the wipe to moisten these areas.
3. Remove disinfectant residue from the device by thoroughly wiping surfaces with a disposable, lint free wipe moistened with 70% Isopropyl Alcohol (IPA) solution.
4. Allow the device to air dry.
5. Discard wipes to clinical waste.
Do not reuse wipes.

Clean and Disinfect Leadwires and Reusable Electrodes

CAUTION:

IMPROPER FUNCTIONING - Leadwires and electrodes that are not functioning properly could result in ECG distortion or failure.

Carefully inspect instruments between uses to verify proper functioning

Refer to the supplier's instructions for leadwire cleaning and disinfection.

Refer to the supplier's instructions for reusable electrode cleaning, disinfection, and sterilization.

Storage

Store the device in a clean and dry, well-ventilated area protected from dust, moisture, insects, vermin, and extremes of temperature and humidity.

Other Cleaning and Disinfection Agents

Super Sani-Cloth® Wipes is the recommended cleaning and disinfection solution, which has been validated on the device. However, below products are compatible with the device and may be used for cleaning and disinfection.

- PDI Easy Screen Cleaning®
- PDI Super Sani-Cloth®
- PDI Sani-Cloth® Bleach
- Clinell Sporocidal Wipes
- PDI Sani-Cloth® AF3
- PDI Sani-Cloth® Plus
- PDI Sani-Cloth® HB
- Clorox Healthcare® Hydrogen Peroxide Cleaner Disinfectant Wipes
- Oxivir® Tb Wipes
- Clinell Universal Range
- Cleanisept Wipes
- Mikrozyd Sensitive Wipes
- Caviwipes
- Phenol 2% (v/v)
- Ethanol (ethyl alcohol) 96% (v/v)
- Hydrogen Peroxide 20% (v/v)

- Sodium Hypochlorite (NaOCl) 5% solution)
- Isopropyl alcohol 70% (m/m)

Additional Information

- GE Healthcare used Super Sani-Cloth[®] wipes during cleaning and disinfection validation. This cleaning agent is not listed in preference to other available cleaning agents which may perform satisfactorily.
- The cleaning and disinfection information is provided in accordance with ANSI/AAMIST81, ISO 17664. The recommendations provided above have been validated as capable of preparing non-sterile GE Healthcare MAC[™] 7 medical devices. It remains the responsibility of the user to make sure that the cleaning and disinfection are performed using appropriate equipment, materials, and personnel and achieves the desired result. This requires validation and routine monitoring of the process. Any deviation from the provided recommendations should be properly evaluated for effectiveness and potential adverse consequences.
- All users should be qualified personnel with documented expertise, competency, and training. Users should be trained on hospital policies and procedures along with current applicable guidelines and standards.
- Users should utilize appropriate Personal Protective Equipment (PPE) when cleaning and disinfecting devices in accordance with the Department of Environmental and Occupational Health and Safety's (OSHA) blood-borne pathogen guidelines or equivalent.

11

Troubleshooting

System Errors

The table lists messages that you may encounter while using this device.

<i>Message</i>	<i>Cause</i>	<i>Solution</i>
WARNING: Approaching <xx>% of ECG storage limit. Transmit and delete reports to free memory.	The device storage capacity is approaching 80% or 90%. This occurs as patient reports are added to the Files list.	Transmit patient reports to configured destinations and delete the transmitted reports from the Files list to create additional storage space.
Memory is full. Transmit and delete reports to free memory.	The device storage capacity is between 99% and 100%.	Transmit patient reports to configured destinations and delete the transmitted reports from the Files list to create additional storage space.
Memory is full. This ECG cannot be saved.	The device storage capacity is full.	Transmit patient reports to configured destinations and delete the transmitted reports from the Files list to create additional storage space.
Memory is full. New ECGs cannot be saved.	The device storage capacity is full.	Transmit patient reports to configured destinations and delete the transmitted reports from the Files list to create additional storage space.
Battery error. Attach power cord. Contact Service.	<ul style="list-style-type: none"> Power sensor failure Battery capacity sensor failure 	Replace the battery. Contact your GE Healthcare Service Support representative if the error persists.
Battery unknown error	An unexpected battery error has occurred.	Replace the battery. Contact your GE Healthcare Service Support representative if the error persists.

<i>Message</i>	<i>Cause</i>	<i>Solution</i>
Battery not detected	The battery is not detected by the device.	Perform below steps: <ol style="list-style-type: none"> 1. Remove the battery. 2. Re-insert the battery. If the battery is still not detected, replace the battery. Contact your GE Healthcare Service Support representative if the error persists.
Device date/time is incorrect. Update.	The date and time set on the device is not correct.	Select Adjust to set the correct date and time. For more information, see <i>Configuring Date and Time</i> chapter of <i>MAC™ 7 Resting ECG Analysis System Setup and Configuration Manual</i> .
Touchscreen failure	The touchscreen is not working.	Contact your GE Healthcare Service Support representative if the error persists.
Cannot perform action while acquiring ECG data	You have tried to perform below actions while acquiring an ECG or rhythm: <ul style="list-style-type: none"> • Start a test for a new patient • Enter or edit patient information (available for rhythm) • Change speed, gain, or filter (available for rhythm) • Access User Menu • Access Orders, Files, or Queue list • Start ECG • Power off, lock, log out, standby or privacy mode 	Perform only allowed actions.

ECG Acquisition Errors

The table lists messages that you may encounter while acquiring ECG.

<i>Message</i>	<i>Cause</i>	<i>Solution</i>
Report generation failed	Unknown error	<ol style="list-style-type: none"> 1. Retry the action. 2. If the error persists, power off and power on the device. 3. If the error persists, contact your GE Healthcare Service Support representative.
Cannot open report		
ECG recording failed		

Printing Errors

Table 28: Printer Errors Encountered During ECG Patient Report Printing

<i>Error Message</i>	<i>Error Condition</i>	<i>How to troubleshoot:</i>
Printer error. Paper jam detected.	Paper is jammed.	Carefully remove the stuck paper from the rollers inside the printer and verify that the remaining papers are loaded correctly in the tray. Printing will restart automatically.
Printer error. Out of paper.	The paper tray is empty.	Insert sufficient paper in the paper tray. Printing will restart automatically.
Printer error. Door is open.	The printer door is open.	Close the printer door. Printing will restart automatically.

Table 29: Printing Errors Encountered During Rhythm Printing

<i>Error Message</i>	<i>Error Condition</i>	<i>How to troubleshoot:</i>
Printer error. Paper jam detected.	Paper is jammed.	<ol style="list-style-type: none"> 1. Carefully remove the stuck paper from the rollers inside the printer and verify that the remaining papers are loaded correctly in the tray. 2. Select Start Rhythm to restart rhythm printing.
Printer error. Out of paper.	The paper tray is empty.	<ol style="list-style-type: none"> 1. Insert sufficient paper in the paper tray. 2. Select Start Rhythm to restart rhythm printing.

<i>Error Message</i>	<i>Error Condition</i>	<i>How to troubleshoot:</i>
Printer error. Door is open.	The printer door is open.	<ol style="list-style-type: none"> 1. Close the printer door. 2. Select Start Rhythm to restart rhythm printing.

Table 30: Printing Errors Encountered During Printing of the List of Stored Records

<i>Error Message</i>	<i>Error Condition</i>	<i>How to troubleshoot:</i>
Printer error. Paper jam detected.	Paper is jammed.	<ol style="list-style-type: none"> 1. Carefully remove the stuck paper from the rollers inside the printer and verify that the remaining papers are loaded correctly in the tray. 2. Select Print List from the Files Manager to restart printing of the stored records list.
Printer error. Out of paper.	The paper tray is empty.	<ol style="list-style-type: none"> 1. Insert sufficient paper in the paper tray. 2. Select Print List from the Files Manager to restart printing of the stored records list.
Printer error. Door is open.	The printer door is open.	<ol style="list-style-type: none"> 1. Close the printer door. 2. Select Print List from the Files Manager to restart printing of the stored records list.
Cannot perform action while printing	<p>You have tried to perform below actions while printing a patient report:</p> <ul style="list-style-type: none"> • Start a test for a new patient • Delete the patient report • Change speed, gain, or filter • Access User Menu • Access Orders, Files, or Queue lists • Power off, lock, log out, standby, or privacy mode 	Perform only the allowed actions.

Table 31: Common Printer Errors

Error Message	Error Condition	How to troubleshoot:
Low Battery. Printer is disabled. Connect power cord.	Low battery	Connect the power cord.
High printer temperature. Printer disabled. Contact Service.	High printer temperature	Restart the system to check if the error is resolved. If the error persists, contact your GE Healthcare Service Support representative.
Printer error. Restart system. Contact Service.	Unknown error or hardware failure in printer	Restart the system to check if the error is resolved. If the error persists, contact your GE Healthcare Service Support representative.
Incompatible firmware.	Incompatible printer firmware	Contact your GE Healthcare Service Support representative to upgrade the printer firmware.
Acquisition error. Fix and retry printing.	Printing stopped due to acquisition error	Rectify the error with the acquisition module and retry printing.
Printer error. Retry. If issue persists, restart system.	Unknown error in printer	Retry printing. If the error persists, restart the system.
Printer is recovering. Please wait ...	Printer recovery error	Wait for the printer to recover. If the error persists, restart the system.
Cannot perform action while printing	<p>You have tried to perform below actions while printing a patient report:</p> <ul style="list-style-type: none"> • Start a test for a new patient • Delete the patient report • Change speed, gain, or filter • Access User Menu • Access Orders, Files, or Queue lists • Power off, lock, log out, standby or privacy mode 	Perform only allowed actions.

Report Transmission Errors

Table 32: Errors Encountered During Patient Report Transmission

Error Message	Error Condition	How to troubleshoot:
Transmission queue is full. Additional reports cannot be added to the queue.	The transmission queue has reached its maximum limit of 1,000 reports.	Wait for the reports in the queue to transmit and try again.
Unable to transmit. Incomplete patient data.	One or multiple patient reports cannot be added to the transmission queue because required fields in the patient demographics are blank or contain invalid data.	<ol style="list-style-type: none"> 1. Edit the incomplete patient report(s) to enter missing patient data. 2. Retry transmission.
Unable to transmit one or more reports. Incomplete patient data.		
Report transmission is in progress. Delete job from queue to edit.	You are trying to edit a patient report that is being transmitted.	Delete the job from the queue to continue editing the patient report.
Destination unknown	The destination is not found.	Reconfigure the destination. See <i>MAC™ 7 Resting ECG Analysis System Setup and Configuration Manual</i> .
No USB device detected	The USB flash drive is not detected.	<p>Verify that the USB flash drive is firmly inserted into the USB port.</p> <p>If the error persists, verify that external USB storage is enabled and the USB port is enabled.</p> <p>If the error persists, use another USB flash drive.</p>
USB storage is full	The USB storage is full.	Remove this USB flash drive, and insert another USB flash drive with write permissions.
USB unknown error	The USB flash drive has an unknown error.	Remove this USB flash drive, and insert another USB flash drive with write permissions.
Cannot copy to USB	The report cannot be transmitted to the USB flash drive.	Make sure that the USB flash drive is firmly inserted into the USB port.

<i>Error Message</i>	<i>Error Condition</i>	<i>How to troubleshoot:</i>
Hilltop generation unsuccessful	The file generation is unsuccessful.	Retry transmission. Contact your GE Healthcare Service Support representative if the error persists.
PDF generation unsuccessful		
Sapphire generation unsuccessful		
Unknown error	Unknown error	Contact your GE Healthcare Service Support representative if the error persists.
Server not connected	The server connection is unsuccessful.	Retry transmission. Contact your GE Healthcare Service Support representative if the error persists.
DCP not found	The DCP connection is unsuccessful.	
Unknown server version	The server version is unknown.	
Server is not accepting the test.	The server is not accepting the transmission.	
No network connection	The network connection is lost.	Reconnect to the network.

Wireless Network Connectivity Errors

Table 33: CA Certificate Errors

<i>Error Message</i>	<i>Error Condition</i>	<i>How to troubleshoot:</i>
CA Certificate PEM Check Failed	The CA certificate format is invalid.	Obtain a PEM-encoded CA certificate.
CA Certificate has expired	The CA certificate has expired.	Obtain a PEM-encoded CA certificate.
CA Certificate is invalid	The CA certificate is invalid.	Obtain a PEM-encoded CA certificate.
Unrecognized certificate format	Certificate format is invalid.	Obtain a PEM-encoded CA certificate.

Table 34: Client Certificate Errors

<i>Error Message</i>	<i>Error Condition</i>	<i>How to troubleshoot:</i>
Client Public Key Certificate PEM Check Failed	The client certificate format is invalid.	Obtain a PEM-encoded client certificate.

<i>Error Message</i>	<i>Error Condition</i>	<i>How to troubleshoot:</i>
Client Certificate has expired	The client certificate has expired.	Obtain a PEM-encoded client certificate.
Invalid Client Private Key Password	The client private key password is invalid.	Enter a valid client private key password.
Client Certificate is invalid	The client certificate is invalid.	Obtain a PEM-encoded client certificate.
CA Certificate Compatibility Check Failed	The client certificate is not compatible with the CA certificate in the device or the CA certificate is not installed in the device.	Obtain a PEM-encoded client certificate which is compatible with the PEM-encoded CA certificate in the device or turn the Self-signed option on.
Unrecognized certificate format	Certificate format is invalid.	Obtain a PEM-encoded client certificate.

Table 35: Errors During Wireless Network Connection

<i>Error Message</i>	<i>Error Condition</i>	<i>How to troubleshoot:</i>
CA Certificate has expired	The CA certificate has expired.	Obtain a PEM-encoded CA certificate.
Client Certificate has expired	The client certificate has expired.	Obtain a PEM-encoded client certificate.
CA and Client Certificates have expired	The CA and Client certificates have expired.	Obtain valid PEM-encoded CA and client certificates.
CA Certificate is not installed	The CA certificate is not installed in the device.	Obtain a PEM-encoded CA certificate.
Client Certificate is not installed	The client certificate is not installed in the device.	Obtain a PEM-encoded client certificate.
CA and Client Certificates are not installed	The CA and client certificates are not installed in the device.	Obtain valid PEM-encoded CA and client certificates.

Table 36: Errors During Network Connection

<i>Error Message</i>	<i>Error Condition</i>	<i>How to troubleshoot:</i>
IP address conflict	The user entered an invalid IP address.	Enter the correct IP address.
Invalid subnet mask	The user entered an invalid subnet mask.	Enter the correct subnet mask.
Invalid default gateway	The user entered an invalid default gateway.	Enter the correct default gateway.

Troubleshooting

<i>Error Message</i>	<i>Error Condition</i>	<i>How to troubleshoot:</i>
Invalid primary DNS	The user entered an invalid primary DNS.	Enter the correct primary DNS.
Invalid secondary DNS	The user entered an invalid secondary DNS.	Enter the correct secondary DNS.



Report Formats

ECG Report Formats

Table 37: Supported 12-Lead ECG Report Formats

Report Format Name	Description	One Page or Multiple Page Report
1 by 10s @25mm/s	Shows one column of 12 rows of waveforms. Each column is 10 seconds wide and printed at 25 mm/s.	One page report
1 by 10s @ 50 mm/s	Shows one column of 12 rows of waveforms. Each column is 10 seconds wide and printed at 50 mm/s. 5 seconds are printed on each page. This results in a two page report.	Multiple page report
2 by 5s @25mm/s	Shows two columns of six rows of waveforms. Each column is 5 seconds wide and printed at 25 mm/s.	One page report
2 by 5s @ 50 mm/s	Shows two columns of six rows of waveforms. Each column is 5 seconds wide and printed at 50 mm/s. One column is printed on each page. This results in a two page report.	Multiple page report
2 by 5s + 1 Rhythm Ld	Shows two parts: <ul style="list-style-type: none"> The upper part consists of two columns of six rows of waveforms. Each column is 5 seconds wide and printed at 25 mm/s. The lower part consists of one row of 10 seconds of one lead. The rhythm lead shown in the report is configurable. 	One page report
2 by 10s	Shows two columns of six rows of waveforms. Each column is 10 seconds wide and printed at 25 mm/s. One column is printed on each page. This results in a two page report.	Multiple page report
4 by 2.5s	Shows four columns of three rows of waveforms. Each column is 2.5 seconds wide and printed at 25 mm/s.	One page report

Report Format Name	Description	One Page or Multiple Page Report
4 by 2.5s + 1 Rhythm Ld	Shows two parts: <ul style="list-style-type: none"> The upper part shows four columns of three rows of waveforms. Each column is 2.5 seconds wide and printed at 25 mm/s. The lower part shows one row of 10 seconds of one lead. The rhythm lead shown in the report is configurable. 	One page report
4 by 2.5s + 3 Rhythm Ld	Shows two parts: <ul style="list-style-type: none"> The upper part shows four columns of three rows of waveforms. Each column is 2.5 seconds wide and printed at 25 mm/s. The lower part shows three rows of 10 seconds of three leads. The rhythm leads shown in the report are configurable. 	One page report
4 by 10s	Shows four columns of 3 rows of waveforms. Each column is 10 seconds wide and printed at 25 mm/s. Three leads are printed on each page. This results in a four page report.	Multiple page report

Table 38: Additional Supported 12-Lead ECG Report Formats

Report Format Name	Description	One Page or Multiple Page Report
Computer Graphic Record (CGR)	Shows three columns of four rows of medians at 25 mm/s on the left side and three rows of waveforms printed at 12.5 mm/s on the right side (resulting in 10 seconds of rhythm). The upper part of the report is text, such as the measurements or interpretation. This results in a one page report.	One page report
Swedish Format 1	Shows two columns of six rows of medians at 50 mm/s on the left side and six rows of waveforms printed at 12.5 mm/s on the right side (resulting in 10 seconds of rhythm). The lower part of the report is text, such as the measurements or interpretation. This results in a one page report.	One page report
Swedish Format 2	Shows below parts: <ul style="list-style-type: none"> The upper part of the report is six rows of 5 seconds of waveform printed at 50 mm/s. The lower part of the report is text, such as the measurements or interpretation. Each column (page) is from the first 5 seconds of data. This results in a two page report.	Multiple page report

Report Format Name	Description	One Page or Multiple Page Report
Rhythm and Morphology Report (RMR)	<p>Shows below parts:</p> <ul style="list-style-type: none"> The upper part of the report is text, such as the measurements or interpretation. The central part of the report is six to eight columns of two rows of medians printed at 25 mm/s. The lower part of the report is three rows of waveforms printed at 25 mm/s (resulting in 10 seconds of rhythm). <p>There are six columns for 12-lead records. This results in a one page report.</p>	One page report
Autorhythm	<p>Shows one column of three, six, or 12 rows of waveforms (selectable). Each column is 10 seconds wide.</p> <ul style="list-style-type: none"> When printing 12 rows, this report does not have space for any additional text, such as the measurements or interpretation. When printing three or six rows, this report contains additional text, such as the measurements or interpretation. 	One page report
Expanded Median	<p>Shows below parts:</p> <ul style="list-style-type: none"> The upper part of the report is text, (such as the measurements or interpretation) and the measurement matrix, which is the measurements for each lead in the record (12 lines). The lower part of the report includes: <ul style="list-style-type: none"> Four columns by three rows of medians at 50 mm/s for 12-lead records Medians printed at either 10 mm/mV or 20 mm/mV. The medians can have vertical tic marks added at the wave onsets and offsets (pon, poff, qon, qoff, and toff). <p>There is no space in this report to print the interpretation. This results in a one page report.</p>	One page report

The figure shows the standard report layout:

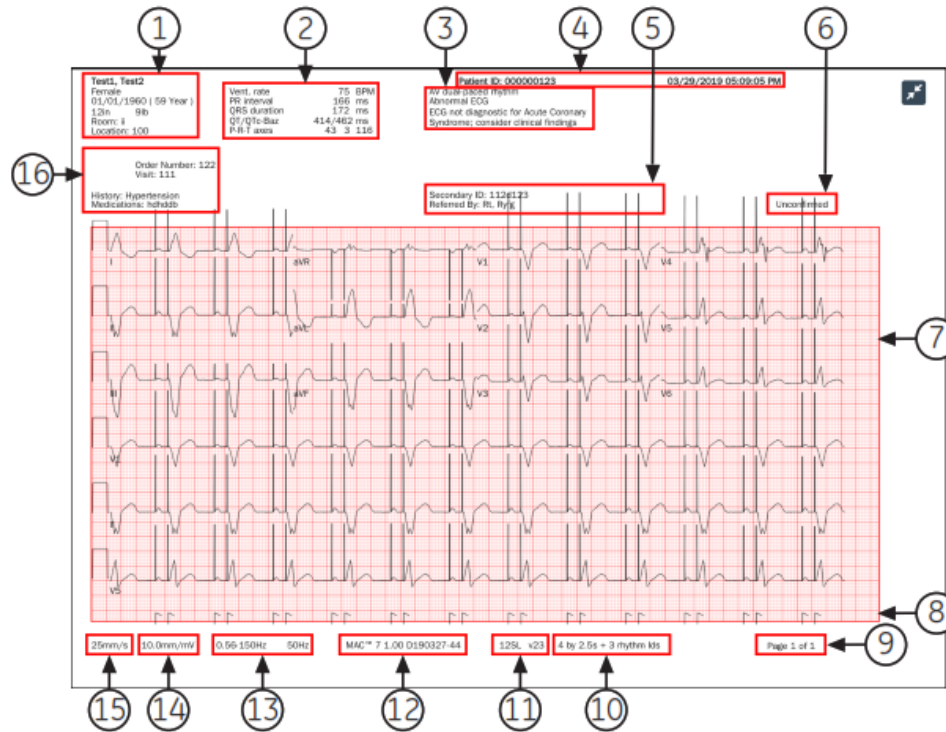



Table 39: Standard Report Layout

Item	Name	Description
1	Patient Demographics	Displays information about the patient, such as: <ul style="list-style-type: none"> • First Name and Last Name • Age and/or Date of Birth • Gender • Race • Height and Weight • Room • Location
2	Vital Signs	Displays information about the patient's vital signs, such as: <ul style="list-style-type: none"> • Heart rate • PR interval • QRS duration • QT/QTc • P-R-T axes • Blood pressure

<i>Item</i>	<i>Name</i>	<i>Description</i>
3	12SL Interpretation Statements	Displays automated 12SL interpretation statements if the report format is configured to include 12SL interpretation statements. Clinicians use this information to make decisions about cardiac care for the patient. The patient report includes ACS interpretation statements when the ECG is recorded with the ACS option. The status of Hookup Advisor is based on the 12SL analysis of the patient report.
4	ECG Header	Displays the Patient ID , date and time of ECG acquisition in the configured date and time format, and the name of the institution, if configured.
5	Physician Information	Displays the details below: <ul style="list-style-type: none"> • Referred by: Name of the physician who referred the patient • Secondary ID: Alternate identification number of the patient
6	Report Status	Displays the status of the report.
7	Waveforms	Displays the 10 seconds ECG patient report in the configured report format for the selected lead set.
8	Pace Annotations	Displays pace annotations for patients with a pacemaker. The pace annotations represent pacemaker pulses. NOTE: When two pace annotations are detected so close to each other that they cannot be uniquely shown on the report, a single pace flag with two flag tips is printed to indicate this condition. 
9	Page Number	Displays the page number of the ECG patient report in the format page x of y, where x is the current page number and y is the total number of pages.
10	Report Format	Displays the configured report format title used to preview the ECG patient report.
11	12SL Version	Displays the 12SL version used to analyze the ECG patient report.
12	Product Model	Displays the product model.
13	Filter Setting	Displays the filter of the ECG waveform (measured in Hz), with Zero Phase Distortion (ZPD for High Pass filter).
14	Gain Setting	Displays the gain of the ECG waveform (measured in mm/mV).
15	Speed Setting	Displays the speed of the ECG waveform (measured in mm/s).

<i>Item</i>	<i>Name</i>	<i>Description</i>
16	Clinical Data	<p>Displays the clinical data gathered during the ECG test, such as:</p> <ul style="list-style-type: none"> • Technician ID <p>NOTE: If the logged-in user has a Technician ID associated with their user account, the Technician ID is automatically populated in the preview. If the user modifies the value of the Technician ID field in the Patient Information screen, the preview is refreshed with the updated Technician ID.</p> <ul style="list-style-type: none"> • Test Indication • Priority • Visit Number • Medical History • List of Medications

Rhythm Report Format

Rhythm reports contain patient information, waveform data, and ECG acquisition data. A rhythm report is a continuous recording of a patient's ECG in a digital format or in print. A continuous rhythm recording is done for a patient so cardiac events are not missed.

This section describes the information contained in a rhythm report and explains where in the report that the information is located. After generating a rhythm report, it is a recommended best practice to review the report before allowing the patient to leave.

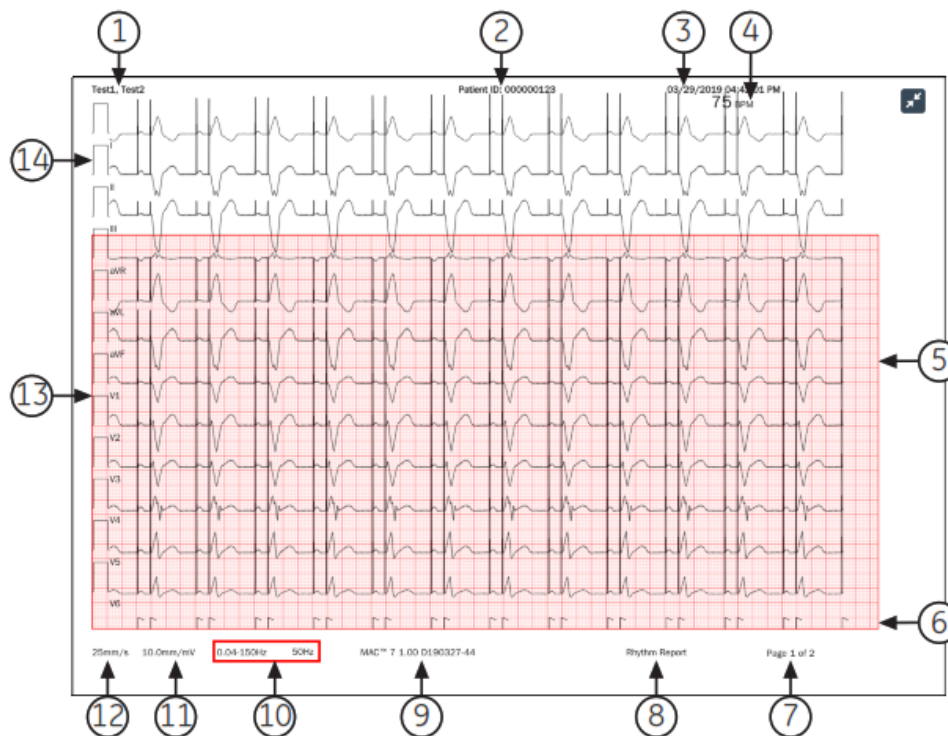



Table 40: Standard Rhythm Report Layout

Item	Description
1	Patient name
2	Patient ID and the name of the institution
3	The date and time of acquisition for the report. If the report contains more than one page, the time of acquisition changes on each page to the current time of acquisition.
4	The beats per minute (BPM) for the heart rate of the patient. If the report contains more than one page, the BPM changes on each page of the waveform data.
5	The waveform data The rhythm report contains waveform data for 12 leads configured for the rhythm report.
6	Pace channel. Pace annotations display in this channel for patients with a pacemaker. The pace annotations show pacemaker pulses. NOTE: When 2 pacemaker pulses are sensed so near each other that they cannot be uniquely shown on the report, a one pace spike with two flag tips is printed to show this condition: 

<i>Item</i>	<i>Description</i>
7	<p>Page number of the report. The page number increments for each page of the rhythm report.</p> <p>For the digital rhythm report, the page number is shown as Page <x> of <y>.</p> <p>For the printed rhythm report, the page number is shown as Page <x>.</p>
8	The type of report format (rhythm report).
9	The product name.
10	<p>The Filter of the ECG waveform (measured in Hz), indicated with ZPD (for High Pass filter).</p> <p>NOTE:</p> <p>You can change the filter before or during the recording and/or printing of a rhythm.</p> <p>For the printed rhythm report, the printing stops and restarts at the newly selected filter. A gap is shown on the printed rhythm report where the change occurred. Each time the rhythm printing starts after a change in filter, a calibration pulse is added for each lead that tells which filter on the printed rhythm.</p> <p>For the digital rhythm report, the calibration pulse of the last filter selected during recording is shown on the full report.</p>
11	<p>The Gain of the ECG waveform (measured in mm/mV).</p> <p>NOTE:</p> <p>You can change the gain before or during the recording and/or printing of a rhythm.</p> <p>For the printed rhythm report, the printing stops and restarts at the newly selected gain. A gap is shown on the printed rhythm report where the change occurred. Each time the rhythm printing starts after a change in gain, a calibration pulse is added for each lead that tells the gain on the printed rhythm.</p> <p>For the digital rhythm report, the calibration pulse of the last gain selected during recording is shown on the full report.</p>
12	<p>The Speed of the ECG waveform (measured in mm/s).</p> <p>NOTE:</p> <p>You can change the speed before or during the printing of a rhythm.</p> <p>For the printed rhythm report, the printing stops and restarts at the newly selected speed. A gap is shown on the printed rhythm report where the change occurred. Each time the rhythm printing starts after a change in speed, a calibration pulse is added for each lead that tells the speed on the is printed rhythm.</p> <p>The digital rhythm report is recorded at the configured rhythm speed.</p>
13	The Leads .

Item	Description
14	<p>The Calibration pulses.</p> <p>When a rhythm recording is started, a calibration pulse is added at the beginning of each lead in the patient report, which shows the speed and gain at which the rhythm is recorded. Each calibration pulse represents 1 mV of amplitude and 200 ms duration of the waveform. Each time the rhythm recording starts after a change in speed or gain, a calibration pulse is printed for each lead.</p> <p>NOTE:</p> <p>The standard grid paper is divided into small squares of 1 mm x 1 mm and large squares of 5 mm x 5 mm. When recording 25 mm/s, 1 second of data is shown in 25 mm (5 large squares) on the rhythm report. When recording 10 mm/mV, 1 mV of data is shown in 10 mm/mV (2 large squares) on the printout.</p>

Full Disclosure (FD) Report Format

Full Disclosure (FD) reports contain patient information, waveform data, and ECG acquisition data in FD buffer at the time of generating report. A FD report is a continuous recording of a patient's ECG in a digital, print, or transmit format for a single lead.

This section describes the information contained in a FD report and explains where in the report that the information is located. After generating a FD report, it is a recommended best practice to review the report before allowing the patient to leave.

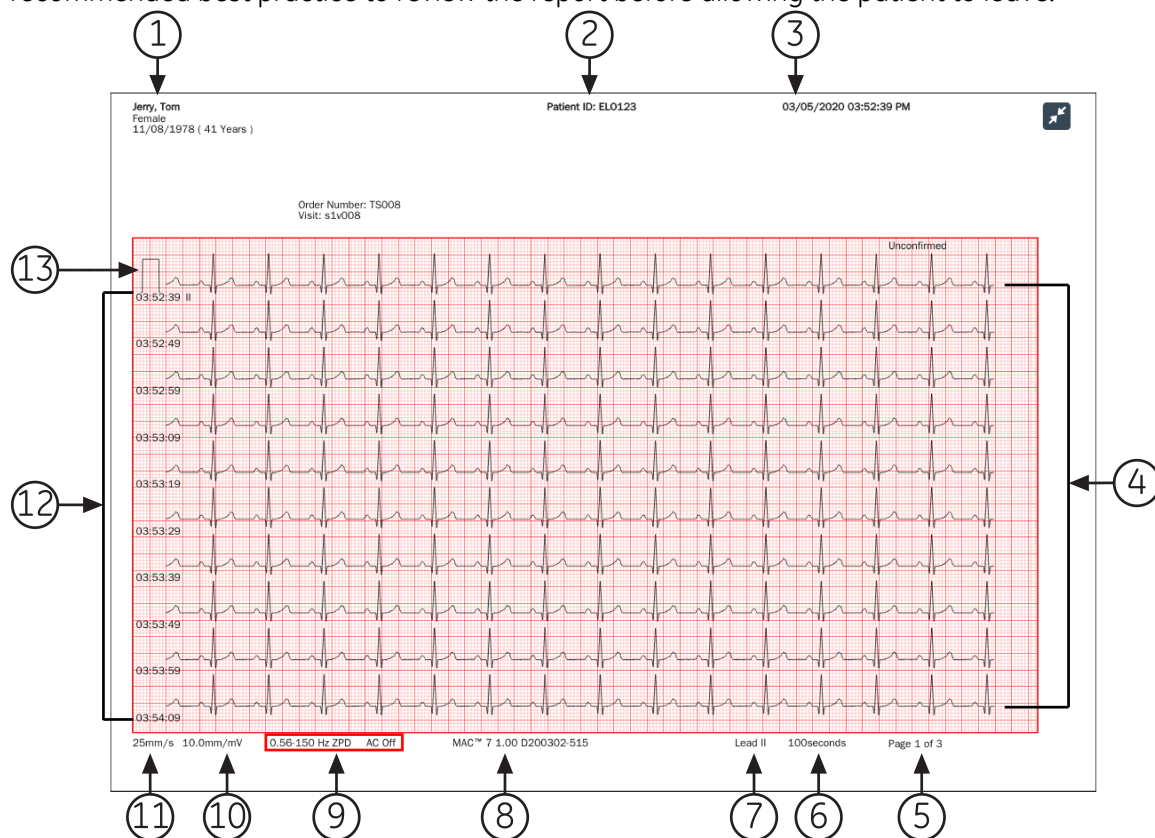
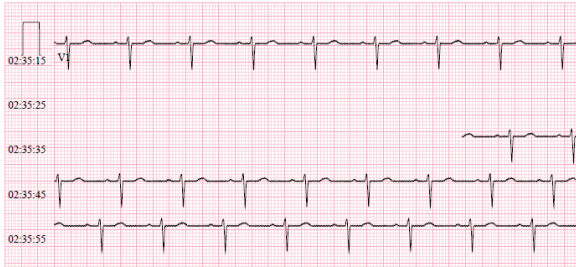
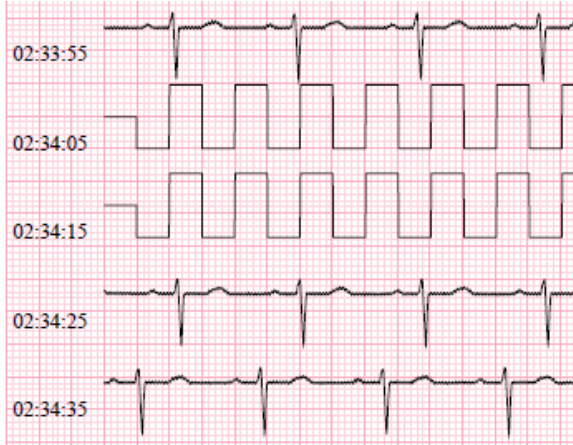


Table 41: FD Report Layout

<i>Item</i>	<i>Description</i>
1	Prints the patient name.
2	Prints the patient ID and name of the institution.
3	Prints the date and time of acquisition for the report.
4	<p>Prints the waveform.</p> <p>The FD report contains waveform data for a single lead selected in Full Disclosure mode.</p> <p>NOTE: A gap is shown on the printed or transmitted FD report when the acquisition module is disconnected.</p>  <p>NOTE: A square waves is shown on the printed or transmitted FD report when the lead is disconnected.</p> 
5	<p>Prints the page number of the report. The page number increments for each page of the FD report.</p> <p>For the FD report, the page number is shown as Page <1> of <3>.</p>
6	Prints the total number of seconds in the rhythm report on each page.
7	Prints the selected single Lead information.

<i>Item</i>	<i>Description</i>
8	Prints the product name.
9	<p>Prints the Filter of the ECG waveform (measured in Hz), indicated with ZPD (for High Pass filter).</p> <p>NOTE: You can change the filter after recording and/or printing of a rhythm.</p> <p>For the printed FD report, the recording stops and restarts at the newly selected filter. Each time the Full Disclosure recording starts after a change in filter, a calibration pulse is added for each lead that tells which filter on the printed rhythm.</p> <p>For the digital FD report, the calibration pulse of the last filter selected during recording is shown on the full report.</p>
10	<p>Prints the Gain of the ECG waveform (measured in mm/mV).</p> <p>NOTE: You can change the gain after recording and/or printing of a rhythm.</p> <p>For the printed FD report, the recording stops and restarts at the newly selected gain. Each time the Full Disclosure recording starts after a change in gain, a calibration pulse is added for a single lead that tells the gain on the printed FD report.</p> <p>For the digital FD report, the calibration pulse of the last gain selected during recording is shown on the full report.</p>
11	<p>Prints the Speed of the ECG waveform (measured in mm/s).</p> <p>NOTE: The digital FD report is recorded at the configured rhythm speed.</p>
12	<p>Displays the time stamp for each row. The time stamp corresponds to clock time when the first sample is acquired in that row.</p>
13	<p>Prints the Calibration pulses.</p> <p>When a rhythm recording is started, a calibration pulse is added at the beginning of a single lead in the patient report, which shows the speed and gain at which the rhythm is recorded. Each calibration pulse represents 1 mV of amplitude and 200 ms duration of the waveform. Each time the Full Disclosure recording starts after a change in speed or gain, a calibration pulse is printed for a single lead.</p> <p>NOTE: The standard grid paper is divided into small squares of 1 mm x 1 mm and large squares of 5 mm x 5 mm. When recording 25 mm/s, 10 rows of data, 10 seconds of data per row is shown in each page on the FD report.</p>



Patient Preparation

Prepare the Patient's Skin

Below steps are necessary to properly prepare a patient's skin before acquiring an ECG.

Careful skin preparation is the key to an interference-free ECG. Signal quality is indicated on the device via the **Hookup Advisor** status and messages.

Signal quality is indicated on the device via the **Hookup Advisor** status and messages.

1. Select the electrode placement sites for ECG diagnosis per the protocol specified by the hospital or physician.
Refer to the electrode placement diagrams and descriptions for the various protocols.

2. Make sure that each site is dry, clean, and free of excessive hair.

NOTE:

Do not use solvents to clean the skin; solvents trapped under electrodes may lead to abnormal skin reactions.

3. Apply the electrodes to the prepared sites.

WARNING:

ELECTRIC SHOCK - Touching the conductive elements cancels the protection provided by the isolated signal input.

Make sure that conductive parts of the electrodes or leadwires, including the neutral electrode, do not come in contact with other conductive parts, including earth.

4. Check the **Hookup Advisor** for any indication of lead problems.

NOTE:

Use only electrodes and contact agents recommended by GE Healthcare. The signal quality on the **Hookup Advisor** is not indicated until the RA/R electrode is applied. If RA/R becomes disconnected, the system reports that all electrodes are off the patient.

Electrode Placement

This section describes various methods for placing electrodes for resting ECGs on a patient.

WARNING:

INACCURATE DIAGNOSIS - Improper connection of the leadwires to the electrodes will cause inaccuracies in the ECG.

Make sure the leadwires are connected properly to the electrodes. Trace each leadwire to its colored connector to make sure that it is matched to the correct label leadwire connection location.

Standard 12-Lead Electrode Placement

To acquire a standard 12-lead ECG, use the electrode placement shown in the diagram below.

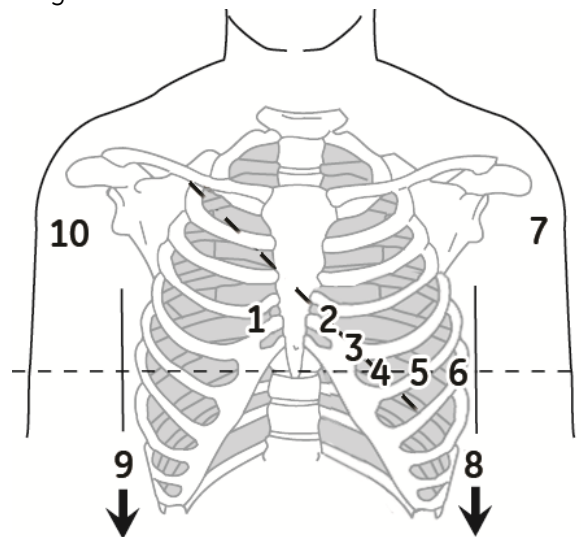


Table 42: Standard 12-Lead Electrode Placement

Item	AHA Label	IEC Label	Description
1	V1 red	C1 red	Fourth intercostal space at the right sternal border.
2	V2 yellow.	C2 yellow	Fourth intercostal space at the left sternal border.
3	V3 green.	C3 green	Midway between location 2 and 4.
4	V4 blue	C4 brown	Mid-clavicular line in the fifth intercostal space.
5	V5 orange	C5 black	Anterior axillary line on the same horizontal level as 4.
6	V6 violet	C6 violet	Mid-axillary line on the same horizontal level as 4 and 5.
7	LA black	L yellow	Left deltoid.

Patient Preparation

<i>Item</i>	<i>AHA Label</i>	<i>IEC Label</i>	<i>Description</i>
8	LL red	F green	Above the left ankle (alternate placement— upper leg as close to the torso as possible).
9	RL green	N black	Above the right ankle (alternate placement—upper leg as close to the torso as possible).
10	RA white	R red	Right deltoid.



Patient Information Fields

Patient Information Text Box Names

When an order is attached to a patient test, all Patient Information text boxes are read-only. The text box names in the table with an asterisk (*) are not.

Table 43: Patient Information text boxes

Name	Description	Length	Accepted Values
<p>Patient ID</p>	<p>Identification number given to the patient.</p> <p>The Patient ID (PID) can be configured by the administrator for a specified country requirement (for example, Denmark, Sweden, or Norway), customize text box names, and add leading zeroes for specified character lengths.</p> <p>If the Patient ID does not agree with the configuration, an error message opens by the Patient ID text box.</p> <p>If the Patient ID agrees with the configuration, the patient Date of Birth and Gender text boxes are automatically updated.</p>	<p>Standard Patient ID:</p> <p>1 to 16 characters</p>	<ul style="list-style-type: none"> • A to Z • a to z • 0 to 9 • All characters are supported.
		<p>Danish Patient ID:</p> <p>10 characters</p>	<p>Valid values: '0 to 9' and '-'. The PID must be in the format <i>ddmmyy-xxg</i> or <i>ddmmyyexxg</i>, where:</p> <ul style="list-style-type: none"> • <i>dd</i> = patient day of birth • <i>mm</i> = patient month of birth • <i>yy</i> = patient year of birth • <i>e</i> = patient year of birth is calculated as follows: <ul style="list-style-type: none"> • <i>e</i> = 0, 1, 2, 3 or 4, if the patient year of birth is between 1900 to 1999. • <i>e</i> = 5, 6, 7, 8 or 9, if the patient year of birth is between 2000 to existent year. • <i>xx</i> = patient place of birth • <i>g</i> = patient gender <ul style="list-style-type: none"> • male = odd number • female = even number
		<p>Swedish Patient ID:</p>	

Name	Description	Length	Accepted Values
		10 (Short) to 12 (Long) characters	<p>Valid values: '0' to '9' and '-' or '+'. The PID must be in one of the below short formats:</p> <ul style="list-style-type: none"> • <i>yymmdd+xxgc</i> • <i>yymmdd-xxgc</i> • <i>yymmddxxgc</i> <p>or in the long formats as follows:</p> <ul style="list-style-type: none"> • <i>yyyymmdd+xxgc</i> • <i>yyyymmdd-xxgc</i> • <i>yyyymmddxxgc</i> • <i>yy</i> and <i>yyyy</i> = patient year of birth • <i>dd</i> = patient day of birth • <i>mm</i> = patient month of birth • + or - = patient age <p>NOTE: If + or - is not before the patient age, the age is less than 100 years.</p> <ul style="list-style-type: none"> • <i>xx</i> = patient place of birth • <i>g</i> = patient gender <ul style="list-style-type: none"> • male = odd number • female = even number • <i>c</i> = checksum digit
			Norwegian PID:

Patient Information Fields

Name	Description	Length	Accepted Values
		11 characters	<p>Valid values: '0 to 9' and '-'. The PID must be in the format <i>ddmmyy-efgxx</i> or <i>ddmmyyefgxx</i>, where:</p> <ul style="list-style-type: none"> • <i>dd</i> = patient day of birth • <i>mm</i> = patient month of birth • <i>yy</i> = patient year of birth • <i>efg</i> = patient year of birth calculated as follows: <ul style="list-style-type: none"> • <i>efg</i> = 000 to 499, if patient year of birth is between 1900 to 1999. • <i>efg</i> = 500 to 750 and <i>yy</i> is more than 49, if the patient year of birth is between 1800 to 1899. • <i>efg</i> = 500 to 999 and <i>yy</i> is less than 50, if the patient year of birth is between 2000 to current year. • <i>g</i> = patient gender <ul style="list-style-type: none"> • male = odd number • female = even number • <i>xx</i> = patient place of birth
<p>Mandatory fields apply for</p>	<p>The mandatory fields that can be configured for Transmission or Acquisition of the ECG report.</p> <p>Based on the Mandatory fields apply for Transmission settings, the ECG report is not added to the transmission queue until you enter the patient demographic data for the mandatory fields.</p> <p>Based on the Mandatory fields apply for Acquisition settings, the ECG report is not accepted, transmitted, or printed until you enter the patient demographic data for the mandatory fields.</p>	Not Applicable	<ul style="list-style-type: none"> • Transmission • Acquisition

Name	Description	Length	Accepted Values
First Name	Patient first name	1 to 20 characters	<ul style="list-style-type: none"> • A to Z • a to z • 0 to 9 • All characters are supported.
Last Name	Patient last name	1 to 40 characters	<ul style="list-style-type: none"> • A to Z • a to z • 0 to 9 • All characters are supported.
Height	Patient height in inches (in) or centimeters (cm), refer to the configured unit of measurement.	Maximum 3 characters	0 to 127 in 0 to 322 cm
Weight	Patient weight in pounds (lb) or kilograms (kg), refer to the configured unit of measurement.	Maximum 3 characters	0 to 999 lb 0 to 454 kg
Gender	Patient gender	Not Applicable	<ul style="list-style-type: none"> • Male • Female
Date of Birth	Patient date of birth	Not Applicable	<p>Enter the patient date of birth in the format configured by your administrator.</p> <ul style="list-style-type: none"> • The date of birth must not be more than the current date. • The date must be less than 127 years from the current date. <p>The date of birth (DOB) also shows in the Patient Information bar. The calculated age shows near it.</p>

Patient Information Fields

Name	Description	Length	Accepted Values
Age	Patient age	Not Applicable	<p>If the Age text box is on the Patient Information screen, the Date of Birth text box is not on the screen.</p> <p>0 to 127</p> <p>Enter the patient age and select the applicable unit of measurement (hours, days, weeks, months, years).</p> <p>The Age also shows in the Patient Information bar. The date of birth (DOB) does not.</p>
Race	Patient race	Not Applicable	<ul style="list-style-type: none"> • Caucasian • Black • Hispanic • American Indian • Eskimo • Hawaiian • Pacific Islander • Asian • Unknown • Other
Order Number	<p>Unique order number given to a patient test. If the order number is given by the computer when an order is attached to the patient test, the order number cannot be edited.</p> <p>NOTE: You can clear the order number which removes the number from the patient test.</p> <p>If you enter an order number manually, you can edit the order number.</p>	1 to 22 characters	<ul style="list-style-type: none"> • A to Z • a to z • 0 to 9 • All characters are supported.
Secondary ID	An alternative identification method.	1 to 17 characters	<ul style="list-style-type: none"> • A to Z • a to z • 0 to 9 • All characters are supported.

Name	Description	Length	Accepted Values
Blood Pressure*	High and Low blood pressures of the patient measured in mmHg.	Maximum 3 characters	0 to 999
Location	Description of where the ECG is to be done. For each patient test, this text box is filled in from the Location ID configured in the System Settings . You can edit the location.	Maximum 5 characters	0 to 65534
Room Number*	The room number where the ECG is to be done.	Maximum 5 characters	<ul style="list-style-type: none"> • A to Z • a to z • 0 to 9 • All characters are supported.
Bed Number*	The bed number where the ECG is to be done.	Maximum 32 characters	<ul style="list-style-type: none"> • A to Z • a to z • 0 to 9 • All characters are supported.
Priority*	Priority of ECG patient test.	Not Applicable	<ul style="list-style-type: none"> • Routine • STAT • PreOp <p>The default is Routine.</p>
Comments*	Additional information	Maximum 127 characters	<ul style="list-style-type: none"> • A to Z • a to z • 0 to 9 • All characters are supported.
Medications	Record of the medications the patient uses which is separated by a comma.	Maximum 32 characters	<ul style="list-style-type: none"> • A to Z • a to z • 0 to 9 • All characters are supported.
Ordering MD Last Name	Physician last name who ordered the ECG.	Maximum 40 characters	<ul style="list-style-type: none"> • A to Z • a to z • 0 to 9 • All characters are supported.

Patient Information Fields

Name	Description	Length	Accepted Values
Ordering MD First Name	Physician first name who ordered the ECG.	Maximum 20 characters	<ul style="list-style-type: none"> • A to Z • a to z • 0 to 9 • All characters are supported.
Ordering MD ID	Physician ID who ordered the ECG	Maximum 5 characters	0 to 65534
Referring MD Last Name	Referring physician last name	Maximum 40 characters	<ul style="list-style-type: none"> • A to Z • a to z • 0 to 9 • All characters are supported.
Referring MD First Name	Referring physician first name	Maximum 20 characters	<ul style="list-style-type: none"> • A to Z • a to z • 0 to 9 • All characters are supported.
Referring MD ID	Referring physician ID	Maximum 5 characters	0 to 65534
Technician*	<p>Technician doing the ECG.</p> <ul style="list-style-type: none"> • If you are a local user and your user account is configured with a technician name or ID, this text box is filled in with the technician configured to your user account. You can edit this text box. • If you are an LDAP user, this text box is filled in with your HIS user ID, if the HIS server is configured. You can edit the ID. 	Maximum 20 characters	<ul style="list-style-type: none"> • A to Z • a to z • 0 to 9 • All characters are supported.
Test Indication*	The ECG is done because of this.	Maximum 64 characters	<ul style="list-style-type: none"> • A to Z • a to z • 0 to 9 • All characters are supported.

Name	Description	Length	Accepted Values
Patient History*	The patient's medical history	Not Applicable	<ul style="list-style-type: none"> Hypertension CAD Cardiac Surgery Unknown
Visit Number	Visit number given to this patient.	Maximum 19 characters	<ul style="list-style-type: none"> A to Z a to z 0 to 9 All characters are supported.
<Question 1>* <Question 2>* <Question 3>* <Question 4>*	The name of this text box is configured by the administrator. See the accepted values of these text boxes before configuration.	Alphanumeric	
		17 characters	<ul style="list-style-type: none"> A to Z a to z 0 to 9 All characters are supported.
		Number	
		10 characters Extra optional one special character (+) or (-) in the beginning	<ul style="list-style-type: none"> 0 to 9
		Yes or No or Unknown	
		Not Applicable	<ul style="list-style-type: none"> Yes No Unknown
Attending MD Last Name*	Attending physician last name	Maximum 40 characters	<ul style="list-style-type: none"> A to Z a to z 0 to 9 All characters are supported.

Patient Information Fields

<i>Name</i>	<i>Description</i>	<i>Length</i>	<i>Accepted Values</i>
Attending MD First Name*	Attending physician first name	Maximum 20 characters	<ul style="list-style-type: none"> • A to Z • a to z • 0 to 9 • All characters are supported.
Attending MD ID*	Attending physician ID	Maximum 5 characters	0 to 65534



Technical Specifications

System Specifications

Table 44: Device Physical Specifications

<i>Item</i>	<i>Description</i>
Device type	Microprocessor augmented automatic electrocardiograph; 12-leadwire acquisition with programmable lead configuration Integrated unit with display and printer
Height	8.2 in (20.8 cm)
Width	12.7 in (32.3 cm)
Depth	15.8 in (40.1 cm)
Weight	12.1 lbs with one battery
USB Port	2 USB 2.0 ports supplying 0.5 Amps of current each
Mechanical design	Housing with fixed angle graphics display Software on mainboard

Table 45: Display Specifications

<i>Item</i>	<i>Description</i>
Display	25.6 cm (10.1 in) diagonal graphics LED backlit full HD
Touchscreen	Projected Capacitive (PCAP) multipoint touch input that works while wearing medical exam gloves
Resolution	1280 X 800 pixels, with waveform enhancement
Data	Heart rate, patient name, patient ID, date and time, battery power indicator, scrolling waveforms, lead labels, speed, gain and filter settings, warning messages, prompts, hookup advisor, and help messages.

Table 46: Printer Specifications

<i>Item</i>	<i>Description</i>
Technology	Integrated thermal dot array
Writer speed	5, 12.5, 25, and 50 mm/s
Number of traces	3, 6 and 12
Sensitivity/gain	2.5, 5, 10, 20 mm/mV, and 10/5 mm/mV split gain
Speed accuracy	5, 12.5 mm/s at $\pm 5\%$ 25, 50 mm/s at $\pm 2\%$
Amplitude accuracy	$\pm 5\%$
Horizontal resolution	40 dots/mm at 25 mm/s
Vertical resolution	8 dots/mm
Paper type	Z-fold thermal with pre-printed grid and perforation
Paper size	215 mm x 280 mm (8.5 in x 11 in) (modified letter) 210 mm x 297.5 mm (8.27 in x 11.7 in) (A4)
Paper tray capacity	Holds up to 150 sheets

Table 47: Electrical Specifications

<i>Item</i>	<i>Description</i>
Power supply	AC mains or battery operation
Input voltage	100–240 VAC $\pm 10\%$
Input current range	1.25A @100V to 625mA @240V
Input frequency	50/60 Hz ± 3 Hz

Table 48: Battery Specifications

<i>Item</i>	<i>Description</i>
Type	Replaceable and rechargeable internal battery
Charge time	Approximately 240 minutes from total discharge when device is off (standby).
Battery capacity	The system shall be able to continuously display scrolling waveforms without printing for a minimum of six hours when the maximum total battery capacity is installed and the batteries are fully charged.

Table 49: Other Input Device Specifications

<i>Item</i>	<i>Description</i>
External USB barcode reader	Fixed and variable length types Symbologies: Code-128, PDF417, Code 39, Interleaved Code 2 of 5, and Data Matrix symbology for characters A-Z (upper case), a-z (lower case), and 0-9 for all supported languages.

ECG Specifications

Table 50: ECG Data Acquisition Specifications

<i>Item</i>	<i>Description</i>
Signal input	Type CF, Defibrillation-Proof Defibrillation protection: Per IEC 60601-2-25:2011
Dynamic range	AC Differential $\pm 10\text{mV}$, DC offset $\pm 600\text{ mV}$
Common mode rejection	>125 dB (>100 dB with AC filter disabled)
Input impedance	>50 M Ω @ 10 Hz, defibrillator protected
Patient leakage current	<10 μA
Detection of pacemaker pulse	Duration: 0.2 ms to 2.1 ms Amplitude: 2 mV to 700 mV Separation: 1 ms or greater
Pace Annotation	Dedicated pace channel on display and printed reports
Pace digital sampling rate	75,000 samples/second per channel

Table 51: ECG Data Processing Specifications

<i>Item</i>	<i>Description</i>
ECG Interpretation	Marquette 12SL ECG Analysis Program for Adults and Pediatrics
Computerized measurements	12-lead analysis
Heart rate meter	30 to 300 beats per minute (BPM) with an accuracy of $\pm 10\%$ or 5 BPM, whichever is greater. Heart rates outside this range will not display.
ECG data formats	GE Hi-Fidelity ECG, XML
Pre-acquisition	Provides 10 seconds of instantaneous ECG acquisition
Digital rhythm	Up to 5 minutes of continuous rhythm storage (exportable as a PDF)

<i>Item</i>	<i>Description</i>
Storage	1000 records consisting of 10 second Resting ECG records and Digital Rhythm records on the device internal memory
External storage	USB-compliant flash drive supporting the FAT32 file system
Downsampled ECG waveform	Bandwidth: 0.04 to 150 Hz Sample rate: 2 ksps Resolution: 1.22 μ V
Analyzed ECG waveform	Bandwidth: 0.04, 0.56 ZPD to 150 Hz Sample rate: 500 and 1000 sps Resolution: 4.88 μ V
Additional report filters	20 Hz, 40 Hz, 100 Hz, or 150 Hz
Channels	Up to 12 channels


Environmental Specifications

Table 52: Environmental Specifications

<i>Item</i>	<i>Description</i>
Operating Conditions	
Temperature	10°C to 40°C (50° F to 104° F)
Relative Humidity (RH)	20% to 95% (non-condensing)
Atmospheric Pressure	70 to 106kPa
Transport/Storage Conditions	
Temperature	-20°C to +60°C (-4° F to 140° F)
Relative Humidity (RH)	15% to 95% (non-condensing)
Atmospheric Pressure	50kPa to 106kPa

Safety Specifications

Table 53: Safety Specifications

<i>Item</i>	<i>Description</i>
Certification marks	 <p>The medical device has a lifetime of 7 years with respect to the Council Regulation EU 2017/745 Annex I, Requirement 6.</p>
Certification	CAN/CSA-C22.2 No. 60601-1, ES60601-1 IEC 60601-1 IEC 60601-1-2 IEC 60601-2-25 IEC 60601-2-51
Type of Protection Against Electrical Shock	Class 1, internally powered
Degree of Protection Against Ingress of Liquids	IP 20
Patient Mode of Operation	Continuous
Patient Leakage Current	<10 µA Normal Condition (NC), <50 µA Single Fault Condition (SFC)
Degree of Protection Against Electrical Shock	Type CF defibrillation-proof applied part

Network Specifications

Table 54: Network Specifications

<i>Item</i>	<i>Description</i>
Frequency bands of transmission	2.401 – 2.461 GHz 5.180 – 5.825 GHz
Maximum radiated power in frequency bands	2.4 GHz: 18.5 dBm 5 GHz: 18.0 dBm
Antenna	Laird Technologies ENB2449A4M-10MHF1
Modulation	DSSS, CCK, OFDM, BPSK, QPSK, QAM
Supported certificate key lengths	1024/2048/4096-bit encryption

Technical Specifications

<i>Item</i>	<i>Description</i>
Supported certificate digest algorithms	SHA1, SHA2
Wireless specifications	
Wireless Standards	802.11a/b/g/n WLAN interfaces Configured manually or via DHCP
Authentication Protocols	<ul style="list-style-type: none"> • Open • WEP • WPA • WPA2
Authentication Methods	<ul style="list-style-type: none"> • PSK • PEAP-MSCHAPV2 • PEAP-GTC • EAP-TLS • TTLS-MSCHAPV2 • TTLS-GTC
Wired Specifications	
Ethernet interface	802.3 Ethernet interface via RJ45 connector
Wired Standards	10Base-T, 100Base-T, and 1000Base-T LAN x 1 port Configured manually or via DHCP

Glossary

ACS	Acute Coronary Syndrome
ADT	Admission, Discharge, Transfer
Filter	<p>A filter sets the upper frequency limit for the ECG waveform displayed on the Acquisition screen and the printout. Selecting a filter eliminates signals that exceed that frequency. The smaller the filter selected, the more signal is filtered out. For example, a filter of 40 Hz displays only signals less than 40 Hz; signals greater than 40 Hz are ignored.</p>
Gain	<p>Gain indicates how many mm represent 1 mV of waveform data on the screen and printout. You can change the gain to modify the display or printout of the waveform to your preference. Changing the gain changes the amplitude of the waveforms. A higher gain makes the amplitude of the waveform appear higher; a lower gain makes the amplitude of the waveform appear lower.</p> <p>The 10/5 mm/mV setting is used to display the limb leads (I, II, III, aVr, aVI, and aVf) at 10mm/mV and chest leads (V1 to V6) at 5 mm/mV. This is done to reduce or prevent waveform overlap in the chest leads, while avoiding tiny waveforms in the limb leads.</p>
HIS	Hospital Information System
LAN	Local Area Network
Speed	<p>Speed indicates the speed the ECG waveform displays on the screen and rhythm printout. You can change the speed to render the waveform slower or faster to aid in viewing or analysis of the waveform. A faster speed makes the waveform display more stretched out; a slower speed makes the waveform display closer together.</p>
WLAN	Wireless Local Area Network



GE Medical Systems
Information Technologies, Inc.
9900 Innovation Drive
Wauwatosa, WI 53226 USA



GE Medical Systems S.C.S.
283 rue de la Minière
78530 BUC, France

GE Medical Systems *Information Technologies, Inc.*, a General Electric Company, going to market as GE Healthcare.

www.gehealthcare.com

