NORAV medical

ECG Excellence

NM-700

INSTRUCTIONS FOR USE

VERSION: 4.5.1

DATE: 03.03.2026

www.norav.com info@norav.com

NM-700. Instructions for Use

For software version: 4.5.1

For Models: NR-1207-3 and NR-314-T

Document Number (D/N): NV-300.451.050 | Revision: 04 | Date of document release: 03.03.2026

Copyright Information

The most recent version of this document can be downloaded from our website:
https://www.noravmedical.com/support-center/

Manufacturer and Contact Information

Manufactured by:
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Compliance Information

This product (software) complies with the applicable requirements of MDD 93/42/EEC.

CE
2797

The NR ECG device is tested and certified for the following standards:

- EN 60601-1: International
- EN 60601-2-25: International

Defibrillation protection: Built in for ECG cable lead wires with "Banana" and "Clip" ends.

This product (software) is intended for installation on equipment that meets the applicable edition of IEC 62368-1. Medical devices used in conjunction with this product must comply with the relevant IEC 60601 series standards, as appropriate. In addition, any electromagnetic interference generated by devices in this configuration must conform to Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014.

⚠Caution: Federal Law restricts this device to sale by or on the order of a licensed physician or healthcare provider.

This product (software) complies with the recognized standards for the analysis of Ventricular Late Potentials using High-Resolution or Signal-Averaged Electrocardiography, as published in 1991 by the Task Force Committee of the European Society of Cardiology, the American Heart Association, and the American College of Cardiology, in accordance with their ongoing acceptance in current clinical practice.

Disclaimer

This product (software) is intended solely as a decision support system for individuals who have received appropriate medical training, and must not be used as the sole basis for making clinical decisions pertaining to patient diagnosis, care, or management. Any application of medical information from the product, other than its original design or intended use, is not advised and is considered misuse of the product.

Important Usage Notice

Like in all medical (including but not limited to ECG) data processing systems, noise or artifacts may produce false-positive events. Therefore, patient data must be reviewed and edited only by a qualified technician or physician who has received appropriate training. Norav Medical and its staff shall not be held liable for patient data reviewed or edited by an unqualified person, or by a qualified person acting outside the scope of appropriate medical judgment.

Norav Medical Limited Warranty

Norav Medical products are warranted to be free from manufacturing and material defects for a period of one (1) year from the date of shipment by Norav Medical or an authorized dealer to the original purchaser.

Expendable supply items, including but not limited to electrodes, leadwires, and patient cables, are excluded from this warranty. This warranty does not apply to any product that Norav Medical determines has been modified or damaged by the customer.

Except for the express warranties stated above, Norav Medical disclaims all warranties, including implied warranties of merchantability and fitness. The stated express warranties are in lieu of all obligations or liabilities on the part of Norav Medical for any damages, including but not limited to special, incidental, indirect, or consequential damages, arising out of or in connection with the use or performance of Norav Medical products.

Any action for breach of warranty must be commenced within one (1) year of the alleged breach or be forever barred. Any repairs made to the product that are not covered by this warranty shall be billed to the customer.

For service or technical support, please contact your local supplier or Norav Medical.

Table of Contents

1. Introduction

Document Conventions

Warnings Cautions and Notes

Pay particular attention to specific points in a procedure when one of the following messages is displayed:

Warning

Warnings call attention to possible hazards involving potential damage or injury to persons.

Caution

Cautions refer to practices necessary to protect against potential damage to equipment or loss of equipment. Pay careful attention to instructions.

Note

Notes provide pertinent information to help obtain optimum software performance or signify an important step or procedure requiring special attention.

Abbreviations and Acronyms

Abbreviation	Meaning
AHA	American Heart Association
BDT	Bulk Data Transfer
BP	Blood Pressure
ECG	Electrocardiogram
GDT	Gerätedatentransfer (device data transfer) A format to transfer data among medical devices and software systems.
HIS	Hospital Information System
ID	Patient Identification
IEC	International Electrotechnical Commission
LQTS	Long QT Syndrome
NEMS	Norav ECG Management System
QT	Time from the start of the Q wave to the end of the T wave
Record	REST/ABPM test
SN	Serial Number
ST Segment	The ST segment encompasses the region between the end of ventricular depolarization and beginning of ventricular repolarization on the ECG (see https://en.ecgpedia.org/wiki/ST_Morphology)
ST Trend	The ST segment inclination
USB	Universal Serial Bus

Equipment Symbols

Symbol	Description
CE 2797	Complies with the Medical Device Directive of the European Union
	Defibrillation-proof type CF applied part (NR-314-T & NR-1207-3 – built in for ECG cable lead wires with "Banana" and "Clip" ends)
	Type CF applied part (NSpiro™ spirometer)
	Class II equipment
	Date of Manufacture
	Waste Electrical and Electronic Equipment (WEEE)

Intended Use

NM-700 Intended Use

NM-700 is a PC-based ECG monitoring system for up to 7 patients.

ECG Intended Use

ECG is intended to disclose either normal condition or patterns of arrhythmia, myocardial ischemia, rate abnormalities, or features of prognostic value in the following cases:

- Patients with suspected cardiac abnormalities
- Populations of patients at an age or period in which a routine baseline evaluation of ECG characteristics is desired.

QT analysis is useful in the assessment of Long QT Syndrome (LQTS). In some instances, LQTS can be corrected by pharmacological therapy. QT analysis is also used to measure QT dispersion, which is the difference between maximal and minimal QT values. QT dispersion is a measure of the inhomogeneity of ventricular repolarization.

NR ECG Device Intended Use

The NR ECG device is intended for recording ECG Tests.

Contraindications for Use and Adverse Effects

The device has no contraindications or adverse events.

2. Overview

Package Contents

The NM-700 package contains the following elements:

- NR ECG device
- Patient ECG cable (AHA or IEC type 10-Lead, 4-Lead, or 5-Lead)
- Bluetooth® USB adapter
- USB extension cable (for Bluetooth® adapter)
- SpO2 oximeters (optional)
- NM-700 software installation CD
- NEMS-A software installation CD
- Installation instructions
- Software license key

Compatible Applications

- NECG Cardiograph
- NM-700 Telemetry

Supported NR ECG Devices

- NR-314-T
- NR-1207-3

Recommended PC Specifications

Component	NM-700
CPU	i5 @ 2.0 GHz 10th generation
RAM	2 GB
Free Disk Space	20 GB
Display Resolution	1600 x 900
Operating System	Windows 10 Pro 32/64 bit or Windows 11 Pro
Free USB/LAN Ports	1

Safety Warnings and Precautions

Warning

- **Electrosurgery** – There is a risk of burns and injury to the patient.
  If an electrosurgical device is used, disconnect the ECG cable from the device.
- **Cables** - Cables present a possible strangulation hazard.
  To avoid possible strangulation, route all cables away from the patient's throat.
- **Conductivity** – Electric shock or device malfunction may occur if electrodes contact conductive materials. Keep the conductive parts of lead electrodes and associated parts away from other conductive parts, including earth.
  Also make sure that no contact to other conductive parts is possible if the electrodes loosen during recording.
- **General Danger to Patient** – Instructions listed in this manual do not supersede established medical practices concerning patient care.
  Perform the established medical practices under all circumstances.
  The device is not designed for direct cardiac application.
- **Explosion Hazard** – Do not use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide.
- **Defibrillation** – Device is defibrillation-protected when the original Norav Medical patient cable is used. However, as a safety precaution, when possible, remove the electrodes before defibrillation.
- **Infection Risk** – Reuse of disposable parts contacting patients poses a risk of infecting patients. Do not reuse disposable parts having direct contact with the patient, such as ECG electrodes.
- **Interpretation Hazard** – Computerized interpretation is significant only when used in conjunction with clinical findings. A qualified physician must review all computer-generated tracings.
- **Magnetic and Electrical Interference** – Magnetic and electrical fields are capable of interfering with proper performance of the device.
  Therefore, make sure all external devices operated in the vicinity of the device comply with the relevant EMC requirements. X-ray equipment or MRI devices are possible sources of interference since they may emit high levels of electromagnetic radiation.
- **Operator** – Medical technical equipment such as this system must be used only by qualified and trained personnel.

Warning

Patient Safety

- A patient undergoing a test must maintain a distance of at least (relates to the wired models only):
  - 1.5 m from the computer, printer, and other peripherals
  - 2.5 m from the ceiling
- If such conditions cannot be fulfilled, the entire system needs to be connected to the AC power supply through an isolation transformer meeting the IEC/EN 60601-1 standard.

Operation with other Devices

- Other devices, which are part of the system, must meet the requirements of the Standard for Information Technology Equipment (IEC/EN 60950-1) and the Standard for Electrical Medical Devices (IEC/EN 60601-1)
- The PC should be approved to the appropriate safety standard for non-medical electrical equipment (IEC/EN 60950-1 or its national variants).
  Also, using additional protective grounding or isolation transformer is required for the electric power circuit to which the NM-700 Telemetry ECG System is connected for compliance with the IEC/EN 60601-1 safety standard.
- Computers and printers used with Medical Devices should be evaluated for IEC/EN 60950-1, IEC/EN 60601-1, or equivalent safety standard to maintain the safety of Medical Devices.
- Accessory equipment connected to the analog and digital interfaces must be certified according to the respective IEC/EN standards (e.g., IEC/EN 60950-1 for data processing equipment and IEC/EN 60601-1 for medical equipment). Furthermore, all configurations shall comply with the valid version of the standard IEC/EN 60601-1. Therefore, anyone who connects additional equipment to the signal input or output connector for configuring a medical system, must make sure it complies with the standard.
- When using NM-700 Telemetry ECG in combination with other equipment, refer to a qualified service technician for correct handling.

Caution

- **Damage to Device from Battery Leakage** – Batteries may leak if left in an unused device for a long period. If you intend to store the device for more than one week, remove the battery.
- **Cable Damage** – Bending or wrapping the cable can damage it. When attaching and affixing the ECG cable, make sure not to bend it excessively. Avoid coiling the ECG cable around the device, as this can damage the cable.
- **Damage to Device** – You may open only the battery compartment of the NR ECG device. Do not use force when handling the NR ECG device.
- **Safety only with Approved Accessories** – Safe and reliable operation of the device is possible only when using the supplied and approved accessories.
- **Difficulties Finding Causes for Malfunctions** – To find and repair a malfunction, both device and ECG cable are needed. Remember to include the ECG cable when returning the device for service or repair (avoid wrapping the ECG cable around the device, as this can damage the cable.)
  Always use the same ECG cable with a device. If an institution has several devices and ECG cables, try to ensure that each device is matched with a specific ECG cable. Thus, cable or NR ECG device failures can be isolated and eliminated faster. In the event of apparent changes in the performance of the device, discontinue use immediately. Do not resume use until the device is approved by the manufacturer or by a representative of the manufacturer.
- **Damage to Device and Accessories** – Unauthorized personnel do not have the proper training to repair the device. Repairs carried out by unauthorized personnel can result in damage to the device or accessories. Send the device for inspection to an authorized facility if you find or even suspect a malfunction. Please add a detailed description of the observed malfunction.
- **Damage to Device** – Take care to prevent chemicals/liquids from entering the connectors or internal part of the device.
- **Pacemaker** – A minimum distance of 15 cm (6 inches) is recommended between the NR ECG device, SpO2 oximeter, and a pacemaker to avoid potential interference with pacemaker. Some studies have shown that wireless devices may interfere with implanted cardiac pacemakers when used within eight inches of the pacemaker. Pacemaker users may want to avoid placing or using a wireless device this close to their pacemaker.
  - Patients with a pacemaker should always keep the NR ECG device and SpO2 oximeter at least 30 cm from their pacemaker when the unit is ON.
  - Patients with a pacemaker should not carry the NR ECG device or SpO2 oximeter in their breast pocket.

  If you have any reason to suspect that interference is taking place, turn off both the NR ECG device and SpO2 oximeter immediately.
- If audio is playing on the PC, the ECG shows interference. Do not run an audio CD on the PC while running an ECG test.
- Operate the unit only at clinics and hospitals. Do not use it at home.
- **Power Supply** – NM-700 Telemetry ECG computer uses Mains power supply. The NR ECG device and SpO2 oximeter use battery power supply.
  On the PC side, there is a signal receiver using a power supply via USB port.
  Use only the recommended battery type as instructed in the technical specifications to operate the NR ECG and SpO2 devices. Do not use batteries with expired dates. Remove batteries from the NR ECG or SpO2 device when it is not in use. Use only with battery compartment closed.

Note

The NR ECG device and SpO2 devices comply with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- This device may not cause harmful interference and
- This device must accept any interference received, including interference that may cause undesired operation.

The manufacturer is not responsible for any Radio or TV interference caused by unauthorized modifications to this equipment. Such modifications can void the user's authority to operate the equipment.

Install hardware only after software installation.

Equipment Classification

- According to the type of protection against electric shock:
  INTERNALLY POWERED EQUIPMENT
- According to the degree of protection against electric shock:
  TYPE CF APPLIED PART
- According to the degree of protection against ingress of water:
  ORDINARY EQUIPMENT
- According to the degree of safety of application in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide:
  EQUIPMENT NOT SUITABLE FOR USE IN THE PRESENCE OF A FLAMMABLE ANAESTHETIC MIXTURE WITH AIR OR WITH OXYGEN OR NITROUS OXIDE.
- According to the mode of operation:
  CONTINUOUS OPERATION

EMC Specifications according to IEC 60601-1-2

Table 1: Electromagnetic Emissions

Emissions Test	Compliance	Electromagnetic Environment—Guidance
This device is intended for use in the electromagnetic environment specified below. The customer and/or user of this device should ensure that it is used in such an environment.		
RF Emissions CISPR 11	Group 2	This device must emit electromagnetic energy in order to perform its intended function. Nearby electronic equipment may be affected.
RF Emissions CISPR 11	Class B	This device is suitable for use in all establishments, including domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic Emissions IEC 61000-3-2	N/A	
Voltage Fluctuations/Flicker Emissions IEC 61000-3-3	N/A	

Table 2: Electromagnetic Immunity

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment - Guidance
This device is intended for use in the electromagnetic environment specified below. The customer and/or user of this device should ensure that it is used in such an environment.			
Electrostatic Discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, relative humidity should be at least 30%.
Electrical Fast Transient/Burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	N/A	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	N/A	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions, and voltage variations on power supply input lines IEC 61000-4-11	±5% U_T (>95% dip in U_T) for 0.5 cycle ±40% U_T (60% dip in U_T) for 5 cycles ±70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec.	N/A	Mains power quality should be that of a typical commercial or hospital environment.
Power Frequency (50/60 Hz) Magnetic Field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: U_T is the AC mains voltage before application of the test level.			

Table 3: Guidance and Manufacturer's Declaration - Electromagnetic Immunity

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment - Guidance
This device is intended for use in the electromagnetic environment specified below. The customer and/or user of this device should ensure that it is used in such an environment.			
Portable and mobile RF communications equipment should be used no closer to any part of the device, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.			
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	**Recommended Separation Distance** $d = 1.17\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	$d = 1.17\sqrt{P}$ 80 MHz to 800 MHz $d = 2.33\sqrt{P}$ 800 MHz to 2.5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey[a], should be less than the compliance level in each frequency range[b]. Interference may occur in the vicinity of equipment marked with the following symbol: 

a. Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the device is used exceeds the applicable RF compliance level above, the device should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the device.

b. Over the frequency range 150 kHz to 80 MHz, field strengths should be less than [3] V/m.

NOTES:

- At 80 MHz and 800 MHz, the higher frequency range applies.
- These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

Table 4: Recommended Separation Distances

The following table details the recommended separation distances between portable and mobile RF communications equipment and NR ECG device.

This device is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. Users of this device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communication equipment (transmitters) and the device as recommended below, according to maximum output power of the communications equipment.			
	Separation Distance According to Frequency of Transmitter (m)		
Rated Maximum Output Power of Transmitter **W**	**150 kHz to 80 MHz** $d = 1.17\sqrt{P}$	**80 MHz to 800 MHz** $d = 1.17\sqrt{P}$	**800 MHz to 2.5 GHz** $d = 2.33\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
1	1.2	1.2	2.3
10	3.7	3.7	7.4
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTES:

- At 80 MHz and 800 MHz, the higher frequency range applies.
- These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

3. Maintenance

Caution	The ECG and SpO2 devices are not waterproof. Do not expose the device to water or any kind of liquid. Maintain in a dry place. **Electrical Hazard** – Improper handling during inspection or cleaning can result in electrical shock. To avoid potential shock, always observe the following guidelines: ➢ Before inspecting or cleaning the system, turn it off, unplug it from AC power, and remove the battery. ➢ Do NOT immerse any part of the equipment in water.

Perform daily inspection, preferably before the equipment is first used each day.

During inspection, make sure the device meets the following minimum conditions:

- Device case is 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 positioned.
- All keys and controls operate properly.

If you notice any items requiring repair, contact an authorized service representative for repair.

Discontinue using the device until the appropriate repairs are made.

Cleaning the Device

Clean the exterior surface of the device monthly, or more frequently if needed.

USE the following materials to clean the device:

- Mild dishwashing detergent
- Clean, soft cloth
- Water

DO NOT USE any of the following materials to clean the device, because their use may damage equipment surfaces.

- Organic solvents
- Ammonia-based solvents
- Abrasive cleaning agents
- Alcohol
- Virex
- Sani-Master

Use the following procedure to clean the surfaces of the device.

1. Dilute mild dishwashing detergent in water to create a cleaning solution.
2. Soak a clean cloth in the solution and wring out any excess.
3. Thoroughly wipe the surface of the device with a damp cloth. Avoid contact with open vents, plugs, or connectors.
4. Repeat Step 2 and Step 3 as necessary until the surface is adequately cleaned.
5. Wipe the surfaces with a dry, clean cloth or paper towel.

Calibration

The device does not require calibration.

4. Software Installation

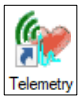
Note

Close all Norav software applications (if any are running) before installing or updating the software.

Installing NM-700 Software

The software package works under Windows 10/11 operating system.

1. Insert the NM-700 installation CD into the CD/DVD drive.
   The installation program starts automatically.
2. Follow the onscreen instructions.
3. After installation is completed, restart the PC.

   The NM-700 icon 

is displayed on the desktop.

Installing NEMS-A Database Optional Software

This option is available with the D1 license.

1. Insert the NEMS-A installation CD into the CD/DVD drive.
   The installation program starts automatically.
2. Follow the onscreen instructions.
3. After installation is completed, restart the PC.

5. Hardware Installation

Safety

Warning

The ECG and SpO2 devices are sensitive to electrical interference.
To prevent possible injury, read this page carefully before installing the device.

- ECG and SpO2 devices are designed to work only with medical devices that comply with the IEC60601-1 standard.
- Connect the Bluetooth® adapter via USB using a compatible cable only. Use only the original USB cable.
- In case of apparent changes in the performance of the device, discontinue use immediately. Do not resume use until the device is approved by the manufacturer or by a representative of the manufacturer.
- If audio is playing on the PC, the ECG shows interference. Do not run an audio CD on the PC while running an ECG test.
- Defibrillation protection is built in.
- To avoid artifacts, use software with 50/60 Hz filter, Baseline filter, and EMG filter.

Installing Bluetooth® Adapter

1. Connect the Bluetooth® adapter to the USB port.
2. The new hardware has been identified.

   After the driver is installed, the Bluetooth® icon appears in the system tray (see Figure 1).

Figure 1: Bluetooth® Adapter Driver Installed

Installing NR-314-T or NR-1207-3 ECG Device

Connecting Patient Cable

Connecting
Insert the ECG cable connector into the socket on top of the NR ECG device ensuring both latches are locked on the device.

Disconnecting
Press both latches while pulling out the ECG cable connector.

Installing Battery

Open the battery compartment cover by moving the cover latch to the left (1), and then moving up (2).

Insert a new AA battery. First insert the negative terminal (1) making sure the removal ribbon is under the battery.

To close the battery compartment cover, first make sure the ribbon is completely under the cover, and then press the cover until its latches are locked in the base part.

Adding NR ECG Devices & SpO2 Oximeters to Bluetooth Device List

Note

Use only alkaline or NiMH rechargeable batteries.

Although zinc–carbon and NiCad rechargeable batteries show adequate voltage in the battery test, the output is often insufficient to carry out monitoring.

1. Make sure the batteries have been inserted correctly.

   Always use fully charged batteries for a new monitoring session. Alternatively, you can use alkaline batteries.

2. Select NR ECG device or SpO2 oximeter.
   - ◊ For NR ECG device, enter **12345** as the pass key.
   - ◊ For SpO2 oximeter, enter the PIN code written on the device backside label.
3. Click **Connect**.
4. After the device is paired, click **Done**.

Installing Software License Key

Connect the HASP dongle to the USB port.

The new hardware has been identified. After the driver is installed, a red indication light appears on the HASP dongle.

Registering NR ECG Devices & Oximeters on Telemetry System

1. Turn ON all telemetry transmitters and SPO2 sensors.
2. Run the NM-700 software.
3. Select Scan devices from the View drop-down list (see Figure 2 - left).
4. When the **Searching…** panel appears, click the **SEARCH** button.
5. Wait until the successful detection message appears (see Figure 2 - right).
6. Click Finish to close the message box (see Figure 2 - right).

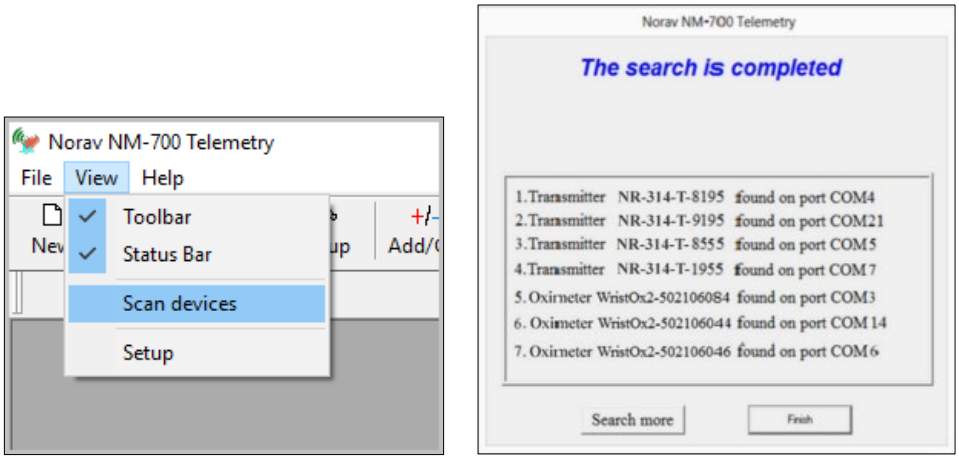


Figure 2: Registering ECG and SpO2 Devices

6. Getting Started

The NM-700 system includes:

- **Telemetry ECG** real-time acquisition application
- **ECG Viewer** application
- **NEMS-A Database** (on a separate CD)

The following sections describe the operation of these interfaces.

Telemetry ECG Real-Time Acquisition Application

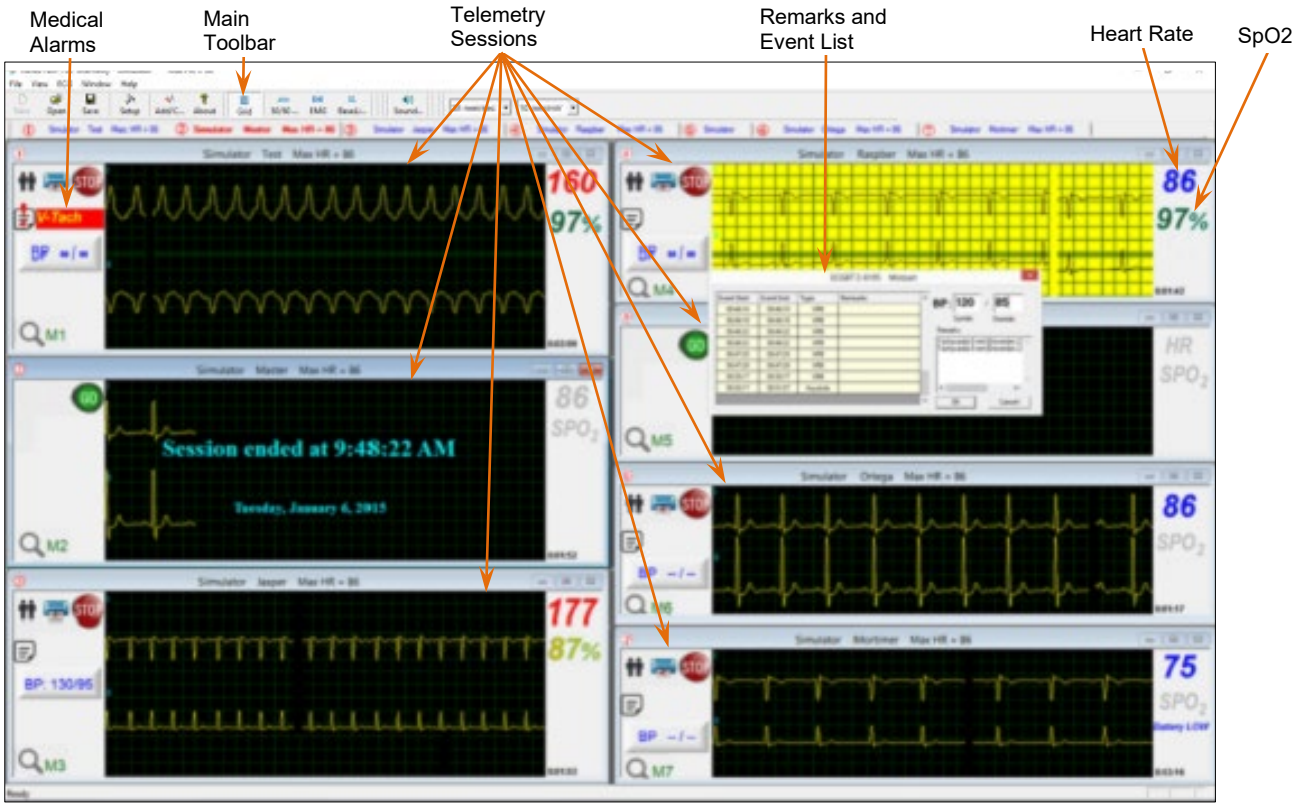
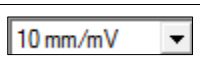
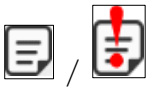


Figure 3: Telemetry ECG Main Screen

Operation by Menu and Icons

Menu	Icon	Description
File		
New		Opens a blank screen divided to seven windows max. (depending on the number of registered BT2 transmitter devices) and numbered tabs above them. Each window refers to a different patient and allows viewing of any connected patient. The patient data should be entered upon starting the ECG recording or during the acquisition.
Open		Opens the NEMS-A database interface displaying lists of patients and their tests that were saved on the disk.
Close		Closes the active window. When unsaved changes were made in this window, a save message appears before closing the window.
Save		Opens the save dialog box to enable saving the recording of the active window to the configured directory on the disk with a selected filename (default name: <patient name>.mnr or <patient ID>.mnr - depending on the saving configuration in the setup dialog box).
Save as		Opens a dialog box allowing saving the study with a different name and/or in a different directory.
Exit		Quit the application. When data is unsaved, a message appears prompting to save data before exiting.
View		
Toolbar		Allows customizing the displayed toolbars.
Status bar		Displays the status bar when selected (default). When this option is deselected, the status bar is hidden.
Scan Devices		Registering of active NM-700 NR ECG devices. The command is available only on the initial screen, immediately after launching the Telemetry ECG application.
Grid		Optionally display a 5-mm raster on the ECG screen.
Patient Data		Opens the Patient Data dialog box allowing inputting or editing patient's details viewed on the active window.
Remarks		Edit Remarks and Event comments. Related to the active ECG recording window. Displays the detected ECG event list. Allows writing comments for detected ECG events or to write free text remarks; input fields to insert BP values.
Setup		Opens a dialog box allowing tailoring the user's preferences for operation (see Section Telemetry ECG Setup Options and Section ECG Viewer Setup Options).
Full Screen		Displays the active window in a full screen mode.

Menu	Icon	Description
ECG		
Start/Stop		Controls starting and stopping the ECG recording.
50/60 Hz Filter		Line interference filter. The user should select either the AC frequency 50 Hz or 60 Hz in the setup.
EMG Filter		Muscle noise filter.
Baseline Filter		Baseline filter.
Mute	 / 	Temporarily suppress (silence) audible alarms. Optionally can be protected with password. The password is **mute**.
Window		
Windows		Opens pop-up menu for selecting the NR ECG devices (ECG active windows) the operator wishes to view. To display a NR ECG device, select the number representing it. Any unselected transmitters are not displayed (default: all stations are selected).
Cascade		Display windows in cascade format.
Tile		Display windows in tile format.
Next		Activates the next window.
Previous		Activates the previous window.
Close All		Closes all windows after confirmation of any unsaved data on the window.
Save All		Saves data on all the opened windows. For new data, the save dialog box is opened allowing naming the data and choosing the directory.
Arrange		Arranges the windows tiled according to their order.
1, 2, 3, …, 7		Lists the opened windows. The active window is selected. Other windows do not bear selection marks.
Help		
About		Displays software version number, licenses, and contact information.
Additional Controls on Main Toolbar		
PAIR		Search for the Station initiating new acquisition session.
Horizontal Scale		Set the ECG view speed (mm/sec.)
Vertical Scale		Set the gain of the ECG signal on the screen (mm/mV).

Menu	Icon	Description
Telemetry Session Window		
Patient Data		Opens the Patient Data dialog box to enable input or edit patient's details viewed in the active session window.
Remarks		Edit Remarks and Event comments. Related to the active ECG session window. Displays the detected ECG events list. Permits writing comments for detected ECG Events or to write free text remarks; input fields to insert BP values.
Print ECG		Click the button on the patient session window to print a current ECG screen.
Start/Stop		Controls starting and stopping the telemetry sessions (ECG recordings).
Blood Pressure		Click the button on the patient session window to input the blood pressure.
HR		Click the button on the patient session window to adjust the Tachycardia and Bradycardia HR alarm thresholds.
SpO2		Click the button on the patient session window to connect the SpO2 oximeter or to adjust the Low SpO2 Alarm threshold.
Expand		Click the button on the patient session window to maximize the session window.
Restore		Click the button on the opened session full screen to restore the initial sizes of session windows.

Telemetry ECG Setup Options

See under	Function	Description
ECG Recording	50 Hz / 60 Hz filter	When 50 or 60 is selected, the status of 50 Hz or 60 Hz filter is ON (default is deselected).
	EMG filter	When selected, the EMG filter is ON (default is deselected).
	BaseLine filter	When selected, the baseline filter is ON (default is deselected).
	ECG Simulator	When deselected (default), ECG recording is received from the NR ECG device. When selected, the ECG recording is received from a demo file included in the software package. In this case, the NR ECG device is not required.
	Use ECG database	When deselected (default), ECG recording is done from and saved to the data directory configured by the user. When selected, the ECG recording is saved in the ECG database directory (the DATA DIRECTORY option is disabled).
	Data directory	Specifying the ECG data file directory in standalone mode. Default: C:\Program Files (x86)\NM_700\Data.
	Source backup directory	Allows setting up the directory for unprocessed ECG data. Default: C:\Program Files (x86)\NM_700\Data.
	Auto Save test data in FDA XML format	Enables exporting the ECG data in the FDA XML format file. Applies to 12-Lead ECG sessions only.
	FDA XML file data directory	Specifying the path for storing the FDA XML data files. Default: C:\ProgramData\NoravMedical\NM700\Data.
	Save options: Auto Save	When **Auto Save** is selected, data is saved automatically (default is deselected).
	Save options: Set File Name By	The default name of a file can be set by the operator as the Patient Last Name or the Patient ID.
View	ECGs color	Allows choosing colors for the ECG application.
Installation	Hospital name	Specifying the name of medical organization.
	Hospital address	Specifying address of medical organization.
	Physician name	Specifying the supervising/reporting person name.
	Measurement standard	Setting the measurement unit according to the preferred measurement type in which the values are displayed (default is Metric standard).

See under	Function	Description
Environment	Display size	Choose the size of the screen. This setting is required for displaying ECG and grid in correct scale.
	Printout options	Select the Print Graph Paper when needed to print 1 mm and 5 mm squares on the printouts. Regular grid is guaranteed to fit any printer. Improved grid shows a finer grid but may not work on some printers.
	Color printout	When color printout option is deselected, the printer prints in black and white only.
	Sample rate	Indicates the sample rate of the ECG recording.
	Smooth ECG trace	Provide smoothing of the ECG trace (on display screen only). The printing quality depends on the system printing settings.
Alarm Limits	HR, SpO2, and ST alarm limits	Defines the default limits for HR, SpO2, and ST alarms. HR and SpO2 alarm limits are adjustable per patient during the monitoring session.
	Password protected mute alarm	Enables the password protection of mute alarm function.

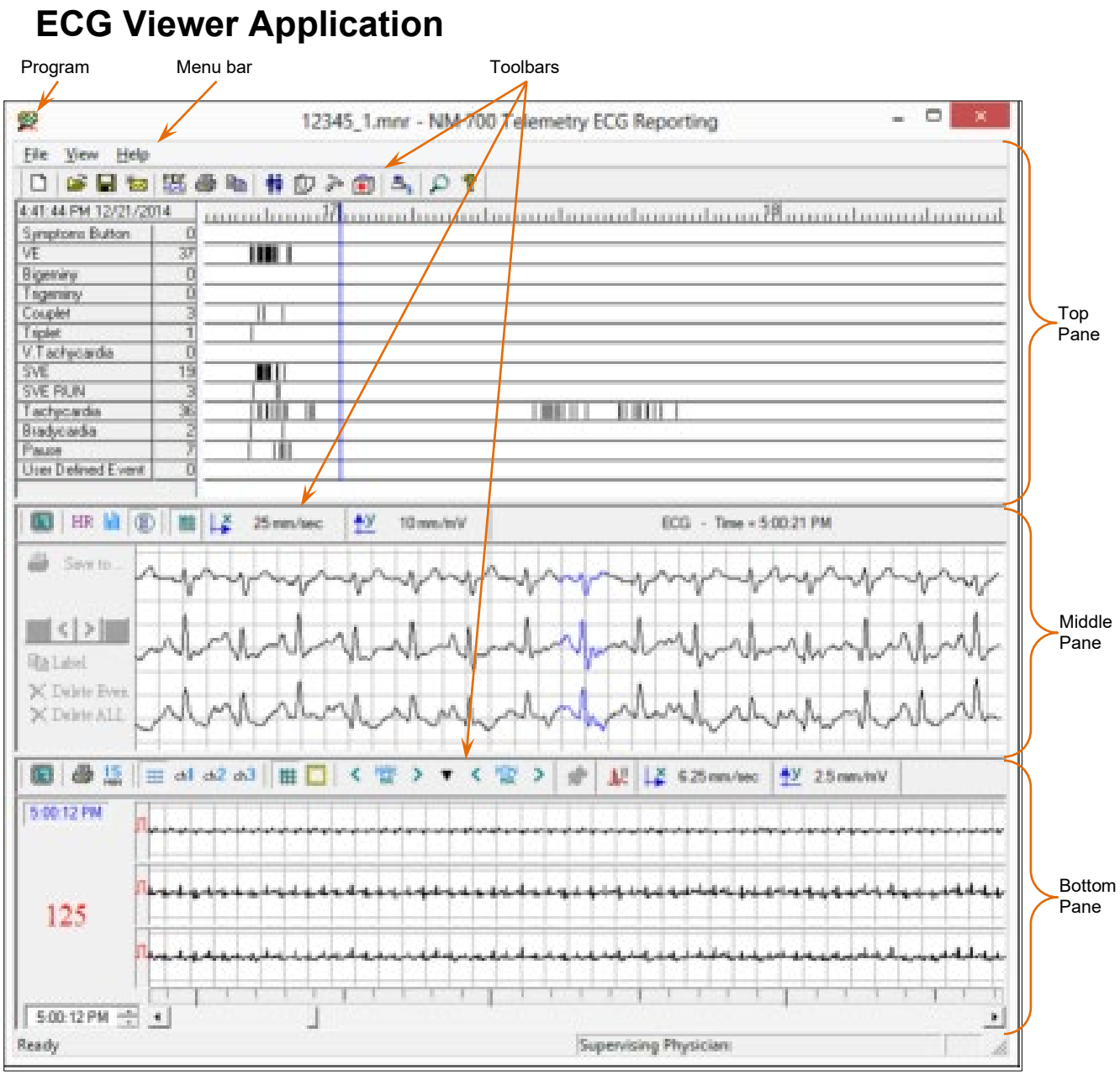
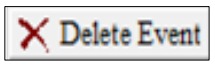


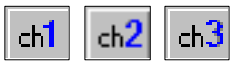
Figure 4: ECG Viewer Main Screen

Operation by Menu and Icons

Top Pane

Menu	Pane/Icon	Description
File		
New		Clears screen.
Open		Shows recordings that are saved on the disk or in the database.
Save		Saves recording on disk.
Save As…		Opens a dialog box to save the file and define the name and the directory of the file.
Send…		Sends the recorded data as an email attachment. Prerequisites: e-mail software and internet connection (not included in the NM-700 package). The recipient must have the NM-700 software installed.
Import from GDT/BDT		Import demographic data from HIS. The file always contains the last patients' data.
Export to GDT/BDT		Export GDT/BDT file to HIS. The file always contains the last patient data.
Customize Reports		To edit the Summary and to select events to print.
		Create PDF file with selected final reports.
Print Reports	Top pane 	Choose and print final reports.
Print Setup		Choose the printer and printer settings.
Exit		Close the ECG Viewer program.
View		
Toolbar		Show/hide the toolbar.
Status Bar		Show/hide the status bar.
Zoom		Change the horizontal scale of the events table.
Patient Data		View/edit the patient information.
Conclusions/ Medication/ Indications		Enter remarks, conclusions, and other comments.
Edit Test Properties		View/edit the recordings' information.
Invert Leads		Change polarity of the ECG traces.
ECG Preview		Open/Close the ECG Preview window (alternatively, use the Spacebar).

Menu	Pane/Icon	Description
Change Supervising Physician		Enables selecting a different supervising physician from the list.
Setup		Set preferences for printing, saving, installation, view, and GDT/BDT settings; edit report labels.
Default Screen Size		Rearrange pane splitters in default positions.
Help		
About		Displays the software version, license and Norav contact information.
Additional Controls		
Top Pane		Download the unprocessed data file.
Middle & Bottom panes		Toggle the pane size between full screen and main screen.
Middle Pane		View the Heart Rate trends.
		View Events / per hour chart.
		View ECG Events (Episodes).
Middle & Bottom panes		Display the 5-mm grid.
		Horizontal scale (speed).
		Vertical scale (gain).
Middle pane		Add an Event to the list of episodes to print.
		Sort Events chronologically or by severity.
		Events navigation control. To play back events in the pane.
		Edit Event Label.
		Delete the selected Event.
		Delete all events in the group.

Menu	Pane/Icon	Description
Bottom pane		Print ECG traces page.
		Print 15 minutes of data on a single page.
		View all channels.
		View a single channel.
		Show frame to define a user event or select an area to print.
		Maximum Heart Rate (HR).
		Minimum Heart Rate (HR).
		Set Maximum HR /Minimum HR.
		Define an event.

ECG Viewer Setup Options

Click  on the main Toolbar to access the following parameters:

Tab	Option	Description
Save	Save Options	If Auto Save is selected, the file is stored by the last name or by the ID. If Auto Save is deselected, a dialog box is displayed during Save, prompting to enter a file name.
	Check NET Key	Select to search the license key in the network.
	Use ECG Database	When the option is selected, the program uses the NEMS-A database. When the option is deselected, the operator can set up the data storage directory.
	Data Directory	For user-defining of the saved ECG recording directories when the ECG database is not used.
	Source Backup Directory	For user-defining of the unprocessed ECG data files directory.
	PDF files Data Directory	For user-defining of the automatically created PDF reports directory.
	Default Filters	Selecting 50 Hz/60 Hz filter and/or EMG filter.
Installation		Saves users' data (hospital and physician).
	Hospital Name	Free text to input the hospital name.
	Hospital Address	Free text to input the hospital address.
	Supervising Physician	Input and edit the physicians' name list.
	Measurement standard	Select either metric or USA measurement standard.
	Display Size	Adjust the onscreen grid according to PC display size.
View	Graph Colors	User-selectable background, traces, grid, and text. colors for the ECG application.
	ECG Full Disclosure Scale Format	Select the horizontal scale (speed) and the vertical scale (gain) of ECG traces.
	Play Speed	Select the play speed.
	Full Screen Event Format	Select the number of windows displayed on the Events screen.
	Episodes to Display	Select event types for display. To remove an Event type from the screen, deselect the event.
	Report list	Select one or more reports for printing. Set the report printing sequence by selecting a report from the list and moving it up or down the list using the UP and DOWN buttons.

Tab	Option	Description
Print Reports	Full Disclosure Printing	Select Fine or Dark.
	ECG Strip Print Scale Format	Use to select the scale format of the printed ECG.
	Summary Report Format	Select either the Free Text Format, Table format, or both to set up the summary report format.
	ST Trend Report Time Scale	Select how to print the ST Trend: entire study on one page, one hour per page, or 30 minutes per page.
	Graph Paper	Select the Regular Grid or Improved Grid for various printer types.
	Auto Print default Reports	Select to automatically print the default reports when closing the record file.
	Auto Create PDF Default Reports	Select to generate PDF reports when closing the record file.
	Print Format	Select the number of events to be printed on one page.
Print Events	Print	Select what to print: user-selected events or the defined number of first events of every type.
	Episodes To Print	Use to select the episodes for print.
	List of Default Remarks	Use to add or delete labels from the list.
Remarks	Automatic options	Set up automatic GDT communication.
GDT/BDT Format	Save test in GDT/BDT	When selected, test is automatically saved in GDT/BDT format.
	Import from GDT/BDT	When selected, test is automatically imported in GDT/BDT format.
	File Format	Select the file format: GDT or BDT.
	Import Codepage 437	Select to import Code page 437.
	Export Codepage 437	Select to export Code page 437.
	Edit Labels	Click to open a dialog box with editable list of field labels used in GDT and BDT files.
	GDT/BDT Data Directory	Define the directory path for saving GDT/BDT files.
	Token for NM-700	Default is PEKG.
	Token for Practice EDP	Default is EDV1.

7. Operation

Workflow Routine

Following is standard workflow routine for telemetry examinations in the NM-700 system:

1. Patient Preparation on page 33.
2. ECG Monitoring on page 34.
3. Alarm System on page 37.
4. Review and Reports on page 38.

Patient Preparation

The ECG trace quality depends very much on the stability and conductivity of the electrodes during the test, especially during exercise when patient movements may cause artifacts.

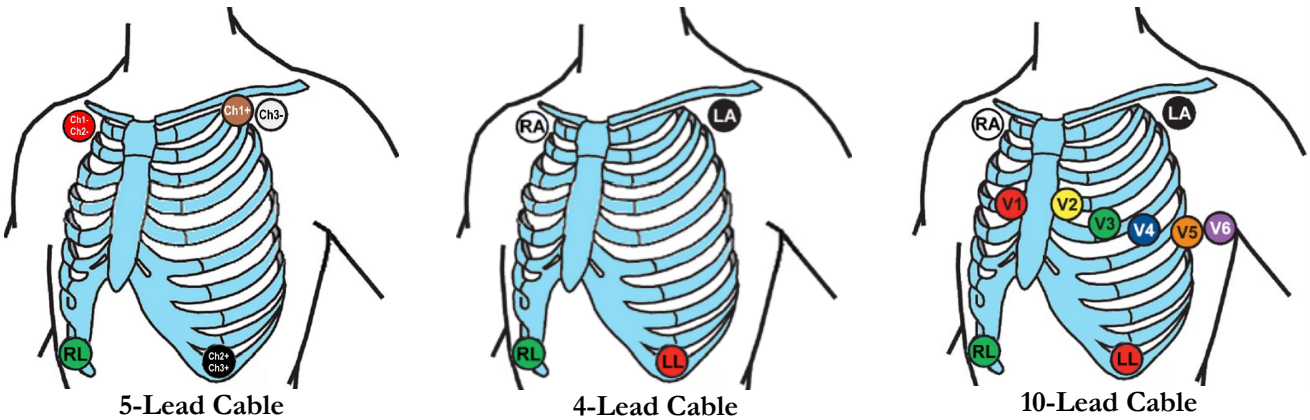
Following are some basic rules for ensuring good electrical contact:

- Shave hair at the electrode contact points.
- Use a special shirt that holds the electrodes and lead wires close to the body.
- Use high quality liquid gel electrodes.
- Make sure the lead wires do not swing.

Attach the leads according to the AHA or IEC color coding (see Table 5 and Figure 5).

Table 5: Patient Cable Marking

Patient Cable Marking			Position on Patient
5 Leads	**AHA Color Codes**	**IEC Color Codes**	
Red Ch1- Ch2-	White RA	Red R	Just below the right clavicle.
Brown Ch1+, White Ch3-	Black LA	Yellow L	Just below the left clavicle.
Green RL	Green RL	Black N	On the left lower edge of the rib cage.
Black Ch2+ Ch3+	Red LL	Green F	On the right lower edge of the rib cage.
	Red V1	Red C1	4th intercostal space, right sternal edge.
	Yellow V2	Yellow C2	4th intercostal space, left sternal edge.
	Green V3	Green C3	Midway between V2 and V4.
	Blue V4	Brown C4	5th intercostal space, midclavicular line.
	Orange V5	Black C5	Anterior axillary line in straight line with V4.
	Purple V6	Purple C6	Midaxillary line in straight line with V4 and V5.



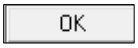
5-Lead Cable **4-Lead Cable** **10-Lead Cable**

Figure 5: Electrode Placements on Patient Chest (AHA Color Codes)

ECG Monitoring

Performing Telemetry ECG Monitoring

1. To turn **ON** the NR ECG device, press the  button on the NR ECG device front panel (see Section Connecting Patient Cable on page 19).
2. Run the **Telemetry ECG** application.
3. On the **Main Menu** click the **New Test button**  or press the **F1** key.
4. Connect the ECG cable to the patient.
5. To start a new telemetry session, select one of the following options:
   - ◊ **Option 1**
     a. Check the serial number of the prepared NR ECG device.
     b. Click on the session window whose label displays the same serial number as that of the prepared NR ECG device.
     c. To run the ECG traces, click the **Start button**  .
   - ◊ **Option 2**
     a. Click the **Pair button**  on the **Main Menu**.
     b. Wait until the green LED starts blinking on the prepared NR ECG device.
     c. To turn ON the NR ECG device, press the  button on the front panel (see Section Connecting Patient Cable on page 19).
     The background color of the session window linked with the NR ECG device is changed and ECG traces are started.

   When the ECG traces show, the **Patient Details panel** appears.
6. Fill in the **Patient Data** and click  to perform the ECG monitoring.
7. At the end of monitoring click on the **Stop button**  .

Features & Options during Telemetry Session

The following features and options are available during the ECG monitoring session (see Figure 6).

- Displaying visual and audible Alarms
- Printing the current ECG screen
- Adding the SpO2 saturation registration to the ECG monitoring session
- Adjusting Alarm limits per patient
- Reviewing of the session history
- Writing comments
- Inserting blood pressure values

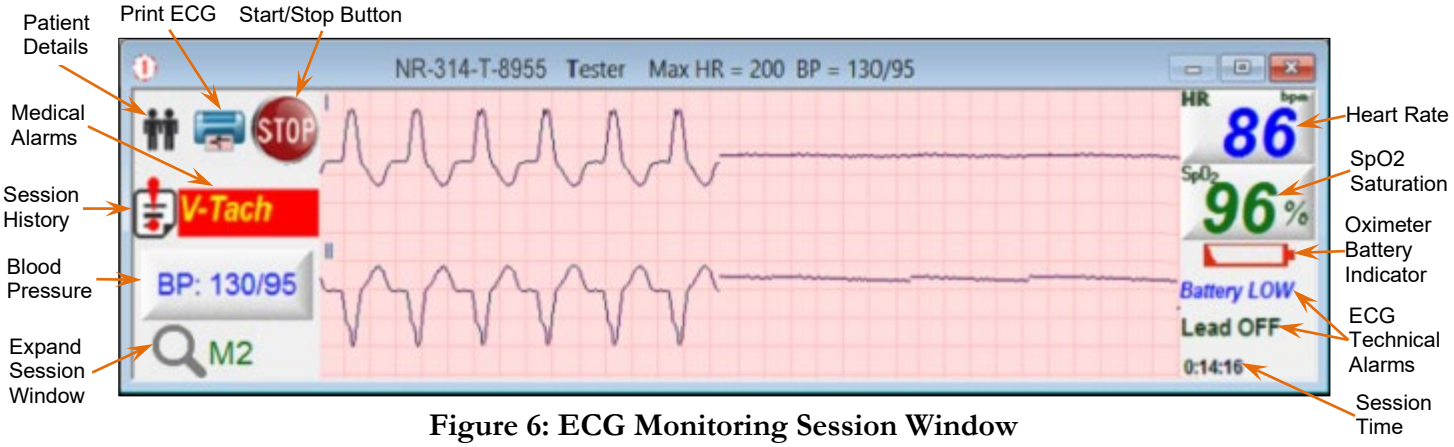


Figure 6: ECG Monitoring Session Window

Printing ECG Screen

To print the ECG screen, click  on the left panel of the session window (see Figure 6).

The current 10-second ECG strip is printed in a six-lead format.

Viewing Session History & Writing Remarks

1. Click  on the left panel of the session window (see Figure 6).

   The **Session History dialog box** is displayed allowing viewing a list of detected arrhythmias and BP values (see Figure 7).

2. Insert new BP systolic and diastolic values, add event(s), event remarks, or write remarks.
3. To apply, click OK.

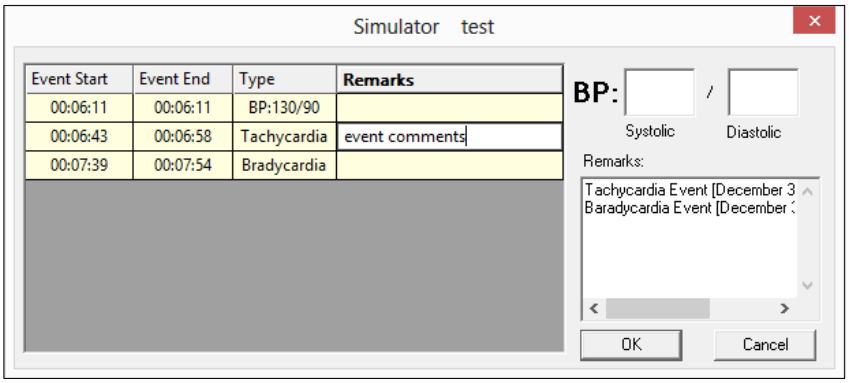


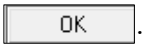
Figure 7: Session History Dialog Box

Inserting Blood Pressure Values

1. To insert BP systolic and diastolic values, click BP --/-- and insert the values (see Figure 6).

Or

Click  to open the Session History dialog box, and then insert the values (see Figure 6).

2. To apply, click 

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Adding SpO2 Monitoring to ECG Session

1. To monitor SpO2 during ECG session, click 

on the right of the ECG session window.

   The **Oximeter connection window** appears.

2. Click the oximeter icon  displayed as **Available**.
3. Wait until the LCD indicator displays **CP** on of the selected oximeter.
4. Click the 

button.

Setting HR Alarm Limits in ECG Session

1. To set HR alarm limits, click 

on the right of the ECG session (see Figure 6).
2. Set the Tachycardia and Bradycardia alarm limits and then click the **Set Limits** button.

Setting SpO2 Alarm Limit & Stopping SpO2 Monitoring

1. To set the SpO2 alarm limit, click 

on the right of the ECG session (see Figure 6).
2. Set the alarm limit value, and then click the **Set Limit** button.
3. To stop SpO2 monitoring during the ECG session, click the **Disconnect SpO2** button.

Alarm System

Overview

The NM-700 Telemetry system includes alarms for identifying medical or technical problems that can impact the health or safety of patients. Alarms are grouped into three types:

- **Medical Alarms** – Asystole, Ventricular Tachycardia, and other heart arrhythmias.
- **Technical Alarms** – Lead Off, Low Battery, and No Signal alerts.
- **Patient Alarm** – Nurse Call. Appears after pressing the button on the NR ECG device.

Visual and audible alarms are available. The operator can observe visual alarms and can control audible alarms by temporary silence.

All detected alarms are stored as Events in the ECG recording file and can be viewed and reviewed offline in the ECG Viewer.

Tachycardia and Bradycardia alarms are configurable in the system setup.
For these alarms, the Heart Rate thresholds can be adjusted individually for each session.

Alarm Priority

Each alarm is assigned to High, Medium, or Low priority groups.

The alarm of highest priority among all monitored patients is the audible alarm.

Additionally, each Medical Alarm is assigned its priority level determining its precedence relative to other Medical Alarms. The Medical Alarm of highest priority for a given monitored patient is indicated on the corresponding patient's session window.

Table 6 describes the priority levels of alarms, visual signals, and audible signals.

Table 6: Alarm Priorities

Alarm	Priority		Indication	
	Group	Level	Visual 👁	Audible 🔈
Medical Alarms				
Asystole (Pause ≥4 sec.)	High	1	Alarm message text blinks quickly on red background.	Five quick high-pitch pulses sound twice, repeated every 20 sec.
Ventricular Tachycardia	High	2	Alarm message text blinks quickly on red background.	Five quick high-pitch pulses sound twice, repeated every 20 sec.
Ventricular Fibrillation	High	2	Alarm message text blinks quickly on red background.	Five quick high-pitch pulses sound twice, repeated every 20 sec.
Tachycardia (High Heart Rate)	High	2	HR value blinks quickly in red.	Five quick high-pitch pulses sound twice, repeated every 20 sec.
Bradycardia (Low Heart Rate)	High	2	HR value blinks quickly in magenta.	Five quick high-pitch pulses sound twice, repeated every 20 sec.
Pause (<4 sec.)	Medium	3	Alarm message text blinks slowly on yellow background.	Three low pulses, repeated every 25 sec.
SVE Run	Medium	4	Alarm message text blinks slowly on yellow background.	Three low pulses, repeated every 25 sec.
VPB Triplet	Medium	5	Alarm message text blinks slowly on yellow background.	Three low pulses, repeated every 25 sec.

Alarm	Priority		Indication	
	Group	Level	Visual 👁	Audible 🔊
VPB Couplet	Medium	6	Alarm message text blinks slowly on yellow background.	Three low pulses, repeated every 25 sec.
Bigeminy	Medium	7	Alarm message text blinks slowly on yellow background.	Three low pulses, repeated every 25 sec.
Trigeminy	Medium	8	Alarm message text blinks slowly on yellow background.	Three low pulses, repeated every 25 sec.
ST Elevation	Medium	9	Alarm message text and ST value on the relevant ECG trace blink slowly in blue on yellow background.	Three low pulses, repeated every 25 sec.
ST Depression	Medium	10	Alarm message text and ST value on the relevant ECG trace blink slowly in blue on yellow background.	Three low pulses, repeated every 25 sec.
SpO2 too Low	Medium	8	SpO2 value blinks slowly in orange.	Three low pulses, repeated every 25 sec.
VPB Isolated	Low	9	Message text on yellow background.	Two consecutive tones, repeated every 60 sec.
SVE Pair	Low	10	Message text on yellow background.	Two consecutive tones, repeated every 60 sec.
SVE Isolated	Low	11	Message text on yellow background.	Two consecutive tones, repeated every 60 sec.
Technical Alarms				
ECG Battery Low	High		**Battery LOW** text blinks slowly on the right panel	Five quick high-pitch pulses sound twice, repeated every 20 sec.
ECG Lead Off	High		**Lead OFF** text blinks slowly on the right panel.	Five quick high-pitch pulses sound twice, repeated every 20 sec.
ECG No Signal	High		Text blinks slowly on the right panel.	Five quick high-pitch pulses sound twice, repeated every 20 sec.
Oximeter Battery Low	Medium		Battery icon blinks slowly under the oximeter button.	Three low pulses, repeated every 25 sec.
SpO2 Sensor Off	Medium		- - -% text blinks slowly on the oximeter button.	Three low pulses, repeated every 25 sec.
No Signal	Medium		- - -% text blinks slowly on the oximeter button.	Three low pulses, repeated every 25 sec.
Patient Alarms				
Nurse Call			Reverted color of the ECG window background.	Quick beep

Review and Reports

Opening Data File Stored on the Hard Drive

1. Run the ECG Viewer application.
2. On the toolbar click  or click **File** on the menu, and then click **Open**.

3. On the dialog box, browse for the appropriate folder and select the ***.mnr** file you need.

Note

When NEMS-A database is used, the database interface is opened instead of the dialog box.

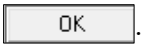
4. Click the **Open** button or double-click the file.

Reviewing Summary Report

To review the summary report after analysis is complete:

1. On the toolbar, click  .
2. Select **Summary Overview**.
3. To print your final report(s), click  on the toolbar.

Editing Patient Data

1. To open the Patient Data dialog box, click  on the toolbar.
2. Insert the new data.
3. To close the dialog box and save the data on the hard drive, click  .

Viewing HR Trend

To view the heart rate trends, click  .

Using the Bottom Pane

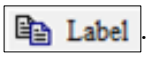
The bottom pane allows viewing full ECG disclosure, in addition to occurrences before and after the viewed Event.

- To view the bottom pane in Full Screen mode, click  on the lower-pane toolbar.

  To return to the 3-pane Main Screen, click  again.
- To print the strip, click  on the lower-pane toolbar.
- To view an individual channel, click  ,  ,or  .

  This allows viewing a larger range of individual channels.
- To view all channels together, click  .
- In the results, numbers displayed in red on the left of the pane, represent a 10-second HR interval describing the middle of the segment shown and starting at the time displayed in blue.

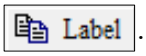
Viewing ECG Events (Episodes)

1. From the top pane, select an event type you wish to review.
2. On the middle pane, click  .
3. Click the event type you wish to view and then click  to play fast-forward each event or click  to playback each event.
4. Stop by clicking the same icon at any given moment.
5. To scroll manually over events, click  or  .
6. To mark an event for print in the final report, click  .
7. To add notes to the event, click  .

Specifying New Event

1. On the bottom pane, click  to open the Frame.
2. Drag the box to the desired ECG, then click  .
3. Select the event type from the drop-down list.

Redefining Event

1. On the middle pane, click  .
2. Change the event type.

Deleting Event

- To delete a single event, select the event for deletion, and click  .
- To delete all events in a group, click  .

Histograms

Select an event for view and click  on the middle pane.

Note

All subsequently selected events are viewed as histograms until it is deselected.

Maximum / Minimum HR

1. To view the maximum or minimum Heart Rate, click  or  on the bottom pane.
2. To change the maximum or minimum Heart Rate, scroll the ECG to the needed point using the  or  buttons, and then click  to store the new maximum HR or minimum HR.

Previewing ECG Traces

1. Press the Spacebar or click  on the bottom pane toolbar.

   The ECG preview window is opened allowing viewing ECG traces in a 6-Lead or 3-Lead format (see Figure 8).

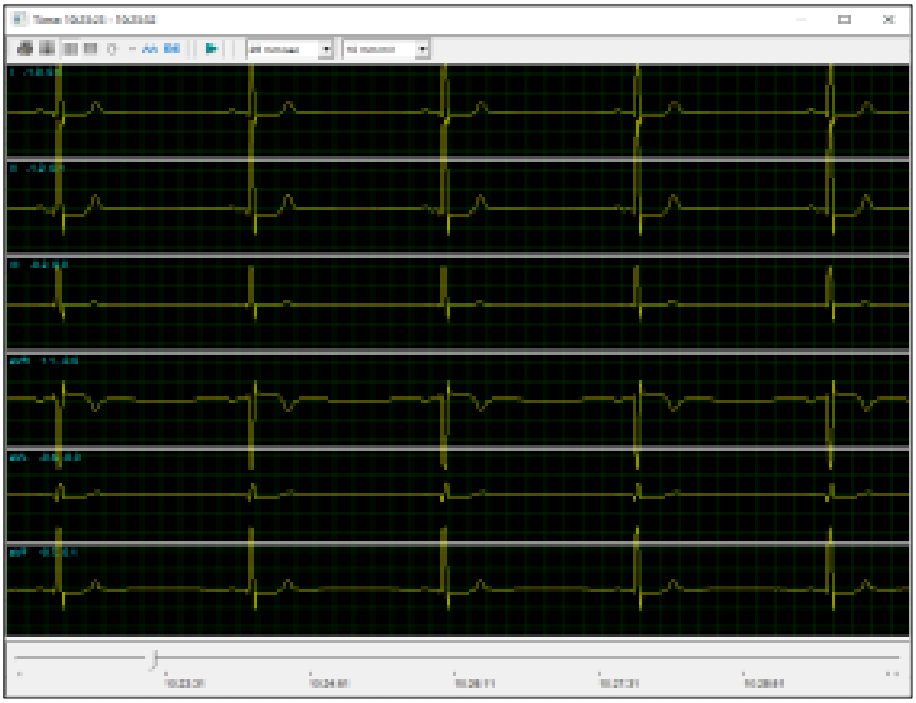


Figure 8: ECG Preview Window

2. Select an icon from the top pane toolbar to perform the actions (see Table 7)

Table 7: ECG Preview Toolbar

Icon	Command	Action
	Print	Printing displayed ECG.
	Next channel	Displaying ECG of the next three channels.
	Toggle view mode	Selecting 6-Lead or 3-Lead ECG view mode.
	50 Hz/60 Hz Filter	AC Line interference filter.
	EMG Filter	Muscle noise filter.
	Play	Playing ECG traces.

Entering Comments

1. To enter conclusions, medications, or indications, click  anytime.
2. Type your comments in the dialog box.

   The comments are printed on the Summary Report page.

Sending Study E-mail

1. To forward a complete study by email, click  .
2. Enter the recipient email address.

Note

Your PC must have an email application.

The recipient must have the NM-700 Telemetry ECG software installed to view the study.

Printing Final Report

1. To print a final report on paper or as PDF file, click  or  respectively on the top pane.
2. Select the required report pages from the dialog box.

   The report summary page can be generated in different formats, as defaults in the print report setup:

   ◊ Free text format
   ◊ Table format
   ◊ Both

   To access this feature:

   a. Click  on the toolbar.
   b. Click the **Print Reports** tab on the **Setup Dialog Box**.
   c. Select the preferred format from the **Summary Report field**.

Troubleshooting

Straight Line Displayed for All Leads

Problem

A straight line appears on the host application screen when the connection to the acquisition box fails.

Solution

1. Verify the connection of the Bluetooth® adapter to the USB port.
2. Make sure the NR ECG device is **ON**.

Noisy ECG Signal on Leads

Problem

A noisy ECG signal on one or more of the leads may be caused due to poor connection of the appropriate electrodes or leads on the patient.

Solution

1. Verify the connection of the appropriate leads on the patient.
2. Make sure electrode proper hookup to the patient.

Appendix A – NR ECG Device Specifications

Feature	Specification		
Model	NR-314-T		NR-1207-3
ECG Lead Cable	5 Leads	4-Lead IEC/AHA	Standard 10-Lead AHA/IEC
Defibrillation Protection	none	Protected against 360 J discharge	
Signal Dynamic Range	±5 mV		
DC Max. Input	±800 mV		
Resolution	12 bits (2.44 μV/LSB)		
ECG Sampling Rate	250, 500, 1000 samples/s		
Input Impedance	>10 MOhm		
CMRR	>90 dB		
Frequency Range (-3 dB)	0.05 Hz to 260 Hz at 1000 samples/s 0.05 Hz to 65 Hz at 250 samples/s		
Communication Interface	Bluetooth® 2.0 + EDR, SPP, Class 1 up to 100 m		
Battery	1 x AA alkaline or NiMH rechargeable		
Operation Time	Up to 7 hours with alkaline battery		
Dimensions	92 mm x 75 mm x 23 mm		
Weight	103 g (without battery)		
Safety Standards	IEC 60601-1, IEC 60601-1-2, IEC 60601-1-11, IEC 60601-2-47		
Operating Temperature	10 °C to 45 °C		
Storage Temperature	-20 °C to 60 °C		
Humidity	10% to 95%		

Appendix B – Oximeter Specifications

Feature	Specification
Manufacturer & Model	Nonin Medical Inc. WristOx$_2$®, Model 3150
Oxygen Saturation Display Range	0% to 100% SpO2
SpO2 Accuracy	±3 Arms
Communication Interface	Bluetooth® 4.2 up to 60 m
Battery	2 x AAA alkaline or NiMH rechargeable
Operation Time	>24 hours
Dimensions	51 cm x 73 cm x 19 cm
Weight	70 g with batteries
Classification per IEC 60601-1, CAN/CSA-C22.2 No. 601.1, and UL 60601-1	• Internally powered (battery) • Type BF applied part • IP3
Operating temperature	-5 °C to 40 °C
Storage temperature	-40 °C to 70 °C
Humidity	10% to 95%