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# HeRO<sup>®</sup> *Service Manual*

Version 3.1

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**MPSC**  
The Power To Predict

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HeRO Service Manuals are available upon request. Single copies are available at no additional cost and will be delivered within seven days of receiving the request.

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## HeRO Solo & Duet

HeRO *solo* and HeRO *duet* are self-contained implementations of HeRO and are built upon the same technology platform. The monitors share a hardware platform, with the difference being in the number of patients monitored. Each processes ECG data from one (*solo*) or two (*duet*) patient monitors and shows HeRO Scores for the monitored bed(s).

### ***Energy Efficiency***

HeRO devices are heart rate variability monitors and are intended to run continuously when connected to a patient. In order to optimize energy efficiency, HeRO solo and HeRO duet monitors should be powered off when not actively monitoring a patient.

### ***Environmental performance***

End of life electronic components may be recycled at an E-waste facility, and end of life mounting components may be recycled at a metals recycling facility.

### ***Maintenance***

Routine maintenance required for HeRO *duet/solo* includes time/date adjustment. Since the system is not connected to the internet and/or server to synchronize time, the time may drift. To minimize this action, MPSC recommends that time/date settings are checked annually and adjusted if necessary. Routine maintenance requires no water, consumables, or replaceable parts.

**Note: Please check the serial number on the back of the HeRO duet/solo monitor to determine which set of instructions are applicable to your system. If the serial number begins with ACD, ADE or ACF please use Instruction #1. If the serial number begins with ACH, ACI or ACJ please use Instruction #2. If the serial number begins with MEDM12 please use instruction #3. If you are unable to locate the serial number, please contact MPSC Technical Support @ +1 800-394-1625 option 5.**

### **Instruction #1: Change Date and Time Settings on HeRO Solo/Duet**

Equipment Required: USB Keyboard and Mouse

1. Remove the plastic cover from the back of the solo/duet monitor (Figure 1). To remove, apply pressure to the top of the plastic cover, on both sides of the hole through which cables pass, and slide down.



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2. Connect a USB keyboard and mouse to the monitor (Figure 1).
  3. Exit out of the full-screen HeRO application by pressing “ALT + F4” on the keyboard.
  4. Move the mouse to the bottom of the screen to make the taskbar appear.
  5. On the taskbar, click *Start/Log Off*.
  6. Log in as user “ServiceUser” with password “serv1ce”.
  7. Right click on the clock display in the taskbar.
  8. Select *Adjust Date/Time* to show the *Date and Time Properties* window.
  9. In the *Date and Time Settings* dialog box, do one or more of the following:
    - To change the hour, double-click the hour, and then click the arrows to increase or decrease the value.
    - To change the minutes, double-click the minutes, and then click the arrows to increase or decrease the value.
    - To change the seconds, double-click the seconds, and then click the arrows to increase or decrease the value.
    - To change the month, click the arrow in the month list, and then click the correct month.
    - To change the year, click the arrows in the year list.
    - To change the day, click the correct day on the calendar.
  10. To change the time zone, click the *Time Zone* tab. In the box above the map, click the drop-down arrow, and select the correct time zone.
  11. Click *OK* to close the *Date and Time Properties* window.
  12. Verify time and date displayed are correct.
  13. On the taskbar, click *Start/Shut Down*.
  14. In the *Shut Down Window*, click the arrow and select *Restart* from the list of options. Then select *OK* to restart the system.  
*(Note: Upon restart, the system will automatically start the HeRO application. If the HeRO application does not open, please contact MPSC Technical Support @ +1-800-394-1625 option 5.)*
  15. Remove the keyboard and mouse from the solo/duet monitor, and reattach the plastic cover to the back of the monitor.

Figure 1. USB connections.

## **Instruction #2: Change Date and Time Settings on HeRO Solo/Duet**

Equipment Required: USB Keyboard and Mouse

1. Remove the plastic cover from the back of the solo/duet monitor (Figure 1). To remove, apply pressure to the top of the plastic cover, on both sides of the hole through which cables pass, and slide down.
2. Connect a USB keyboard and mouse to the monitor (Figure 1).



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3. Exit out of the full-screen HeRO application by pressing “ALT + F4” on the keyboard.
  4. Move the mouse to the bottom of the screen to make the taskbar appear.
  5. On the taskbar, click Start , and then select the arrow next to Shut Down to display a list of options. Select Log off from the list.
  6. Select ServiceUser from the list of available users, and enter password “serv1ce”.
  7. Right click on the clock display in the taskbar.
  8. Select Adjust Date/Time to show the Date and Time Properties window.
  9. Select the Change date and time... button.
  10. Change the settings using the following instructions:
    - To change the hour, double-click the hour, and then click the arrows to increase or decrease the value.
    - To change the minutes, double-click the minutes, and then click the arrows to increase or decrease the value.
    - To change the seconds, double-click the seconds, and then click the arrows to increase or decrease the value.
    - To change the month and year, use the left and right arrows to move to the correct month and year.
    - To change the day, click the correct day on the calendar.
  11. Click OK to save and close the Date and Time Settings window.
  12. To change the time zone, click the Change time zone... button. In the Time Zone Settings window, click the drop-down arrow and select the correct time zone.
  13. Click OK to close the Time Zone Settings window.
  14. Click OK to save and close the Date and Time Properties window.
  15. Verify time and date displayed are correct.
  16. On the taskbar, click Start , and then select the arrow next to Shut Down to display a list of options. Select Restart from the list.

*(Note: Upon restart, the system will automatically start the HeRO application. If the HeRO application does not open, please contact MPSC Technical Support @ +1-800-394-1625 option 5.)*
  17. Remove the keyboard and mouse from the solo/duet monitor, and reattach the plastic cover to the back of the monitor.

Figure 1. USB connections.

### **Instruction #3: Change Date and Time Settings on HeRO Solo/Duet**

Equipment Required: USB Keyboard and Mouse, Small Philips Head Screwdriver

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1. Remove the plastic cover from the back of the solo/duet monitor. Three screws need to be removed before the plastic cover can be removed.
  2. Connect a USB keyboard and mouse to the monitor.
  3. Exit out of the full-screen HeRO application by pressing “ALT + F4” on the keyboard.
  4. Move the mouse to the bottom of the screen to make the taskbar appear.
  5. On the taskbar, right click Start , select Shut down or sign out and then select Sign out.
  6. Click on screen to display list of users and select Select ServiceUser. Enter password “Serv1ceH3RO”.
  7. Right click on the clock display in the taskbar and select Adjust date/time.
  8. Select the Change button.
  9. Change the date and/or time using the drop down menus.
  10. Select the Change button to save the changes.
  11. To change the time zone, use the drop down menu in the Settings window.
  12. Close the Settings window by clicking the X in the upper right hand corner of the window.
  13. Verify time and date displayed are correct.
  14. On the taskbar, right click Start , select Shut down or sign out and then select Restart.  
*(Note: Upon restart, the system will automatically start the HeRO application. If the HeRO application does not open, please contact MPSC Technical Support @ +1-800-394-1625 option 5.)*
  15. Remove the keyboard and mouse from the monitor, and reattach the plastic cover to the back using the three screws removed previously.

## ***Cleaning***

**The hardware components of HeRO *solo* or *duet* may be cleaned with most mild, non-abrasive solutions commonly used in the hospital environment **as needed per the instructions below. The environmental impact of these materials can be managed using existing hospital practices and procedures.****

### HeRO Display, Data Acquisition Device (AD2), and cables

- Disconnect this equipment from any AC outlet before cleaning. The equipment can be wiped or dusted with a damp cloth. Do not use liquid or spray detergents for cleaning.

### HeRO roll stand, desk stand, and wall mount

- The mounting assembly may be cleaned with most mild, non-abrasive solutions commonly used in the hospital environment (e.g. diluted bleach, ammonia, or alcohol solutions).
- The surface finish will be permanently damaged by strong chemicals and solvents such as acetone and trichloroethylene. Do not use steel wool or

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other abrasive material to clean the mounting assembly. Damage caused by the use of unapproved substances or processes will not be covered by warranty. We recommended that you test any cleaning solution on a small area of the mounting assembly that is not visible to verify compatibility.

- Never submerge the roll stand or allow liquids to enter the mounting assemblies. Wipe any cleaning agents off the mounting assembly immediately using a water-dampened cloth. Dry all mounting assemblies thoroughly after cleaning.

## ***Troubleshooting***

Please review the following issues and corresponding resolutions if you are having issues with your HeRO *Solo or Duet* system. Resolutions are listed in chronological order to provide the most efficient steps to resolve the issues. If the resolution steps do not resolve the issue, please contact MPSC Technical Support @ +1-800-394-1625 option 5.

**Issue: HeRO application is not displayed on the screen.**

**Resolution:** *Manually start the HeRO application by double-tapping the HeRO icon on the system desktop, or restart the system to allow the HeRO application to open automatically on startup.*

**Issue: Historical data from previous patient appears for current patient.**

**Resolution:** *Press the “Discharge” Button on the corresponding bed to remove historical data from the previous patient.*

**Issue: The data acquisition light is not green, so the system is not collecting data.**

**Resolution 1:** *Verify the HeRO cable is properly connected to the monitor and the HeRO system.*

**Resolution 2:** *Verify the ECG waveform on the physiological monitor is not noisy. If the ECG waveform is noisy, complete the following steps until the issue is resolved:*

- Change the lead displayed on the physiological monitor.*
- Modify the ECG lead placement on the patient to reduce the amount of noise.*
- Replace the HeRO cable. Defective HeRO cables may be recycled at an E-waste facility.*

**Issue: The data acquisition light is green, but I am not getting a HeRO score.**

**Resolution 1:** *Click on the HeRO bed to open the Patient View and verify more than 4 hours of continuous historical data exists for the patient. If not, allow the system to collect more data and check for a HeRO score after 4 hours of data collection.*

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**Resolution 2:** Click on the HeRO bed to open the Patient View and verify the patient's heart rate is above 80bpm. The lower operating limit of HeRO is 80bpm, so the collected heart rate must consistently be above the lower limit to create a HeRO score. (Note: The HeRO system will create a score once the heart rate consistently stays above the lower limit.)

**Issue: A “COMM Error” message is displayed for the beds.**

**Resolution 1:** Verify the data acquisition device is powered on.

**Resolution 2:** Verify the network cable that connects from the solo/duet monitor to the data acquisition device is properly connected on both ends.

**Issue: Patient information (Name & MR#) is not displayed when using serial data acquisition.**

**Resolution 1:** Verify the patient information is entered on the physiological monitor, and the patient has been admitted to the monitor.

## HeRO Symphony

HeRO symphony is a server based implementation with central monitoring that can acquire data from many monitors directly using Data Acquisition Devices (DADs) or from the Physiological Monitoring Network. Components of this systems include the Server, one or more Viewing Stations, and Data Acquisition Devices (if required for data acquisition).

### **Components**

#### **Server**

The **HeRO** Server can be a commercial server-class rack mountable PC provided by MPSC, or a virtual server provided by the customer. It serves as the hub-of-the-wheel: it computes **HeRO** scores, stores the main **HeRO** database, coordinates patient transfers, and stores settings for the other components of the **HeRO** system.

#### **Viewing Stations**

The Viewing Stations present the **HeRO** user interface to clinicians and staff. In a typical installation, several dedicated viewing stations (thin client computers with monitors) are deployed in various points throughout the NICU. The **HeRO** web client application can also be installed on any existing computers running Microsoft Windows 10 or later, and Internet Explorer 11 or Google Chrome.

#### **Data Acquisition Device (DAD)**

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The Data Acquisition Device is used to gather ECG waveform data from an existing ECG monitor and perform mathematical algorithms to determine patterns of HRV. The AD2-DAD is a small, brick-sized device that is connected to an analog signal output on the ECG monitor and to the hospital Clinical Network. It is approved for installation in the patient environment or in a data closet.

### ***Energy Efficiency***

HeRO devices are heart rate variability monitors and are intended to run continuously when connected to a patient.

### ***Environmental performance***

End of life electronic components may be recycled at an E-waste facility, and end of life mounting components may be recycled at a metals recycling facility.

### ***Maintenance***

Apart from cleaning (see below), the hardware components (Viewing stations and AD2s) of the HeRO Symphony system do not require regular maintenance. When necessary, MPSC technical personnel shall perform any necessary configuration changes or hardware replacements.

MPSC recommends the installation of operating system patches and/or anti-virus updates on the Server computer as these become available. Data backups are only necessary on the Server computer, and can be configured as part of the server installation. In a virtual environment, the customer is responsible for any backups of the server.

### ***Cleaning***

The hardware components of the HeRO Symphony system (including, as applicable, the Server computer, Viewing Stations, AD2-DADs, and cables) may be dusted or wiped with a damp cloth as needed.

### ***Troubleshooting***

Please review the following issues and corresponding resolutions if you are having issues with your HeRO Symphony system. Resolutions are listed in chronological order to provide the most efficient steps to resolve the issues. If the resolution steps do not resolve the issue, please contact MPSC Technical Support @ +1-800-394-1625 option 5.

**Issue: HeRO application is not displayed on the screen.**

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**Resolution:** Manually start the HeRO application by double-tapping the HeRO icon on the system desktop, or restart the system to allow the HeRO application to open automatically on startup.

**Issue: The data acquisition light is green, but there is no patient information and no HeRO score.**

**Resolution:** Verify the patient information has been entered on the HeRO system or ECG monitor if HeRO is acquiring data from the monitor network.

**Issue: The patient information is displayed (Name & MR#), but the data acquisition light is not green so the system is not collecting data.**

**Resolution 1:** Verify the HeRO cable is properly connected to the monitor and the HeRO system.

**Resolution 2:** Verify the ECG waveform on the physiological monitor is not noisy. If the ECG waveform is noisy, complete the following steps until the issue is resolved:

- a. Change the lead displayed on the ECG monitor.
- b. Modify the ECG lead placement on the patient to reduce the amount of noise.
- c. Replace the HeRO cable. Defective HeRO cables may be recycled at an E-waste facility.

**Issue: The data acquisition light is green, but I am not getting a HeRO score.**

**Resolution 1:** Click on the HeRO bed to open the Patient View and verify more than 4 hours of continuous historical data exists for the patient. If not, allow the system to collect more data and check for a HeRO score after 4 hours of data collection.

**Resolution 2:** Click on the HeRO bed to open the Patient View and verify the patient's heart rate is above 80bpm. The lower operating limit of HeRO is 80bpm, so the collected heart rate must consistently be above the lower limit to create a HeRO score. (Note: The HeRO system will create a score once the heart rate consistently stays above the lower limit.)

**Issue: A "COMM Error" message is displayed for a HeRO bed.**

**Resolution:** Turn on the ECG monitor, or take it out of Standby mode.

**Issue: A "No Wave" or "No Heart Rate" message is displayed for a HeRO bed.**

**Resolution:** Turn on the ECG monitor and admit a patient to the bed.

**Issue: A "No Name" message is displayed for a HeRO bed.**

**Resolution:** Edit the patient info on the ECG monitor to include a valid patient name.

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**Issue: A “No MR#” message is displayed for a HeRO bed.**

**Resolution:** *Edit the patient info on the ECG monitor to include a valid medical record number (MR#).*

**Issue: A “MR# Conflict” message is displayed for a HeRO bed.**

**Resolution:** *Check the message at the bottom of the HeRO application to find out which 2 beds have a MR# Conflict. This means patients with the same medical record number (MR#) have been assigned to 2 beds, so discharge one patient or update the MR# for a patient.*

## HeRO ES

**HeRO ES** acquires data from a user-supplied ECG monitor, and requires a monitor with an integrated PC. HeRO ES is a stand-alone implementation of HeRO that processes heart rate data on the Philips Integrated PC (iPC) and shows the HeRO Scores at the bedside, on the main display of the physiological monitor.

### ***Maintenance***

HeRO ES is a software only product, so no maintenance is required.

### ***Cleaning***

HeRO ES is a software only product, so no cleaning is required.

### ***Troubleshooting***

Please review the following issues and corresponding resolutions if you are having issues with your HeRO ES system. Resolutions are listed in chronological order to provide the most efficient steps to resolve the issues. If the resolution steps do not resolve the issue, please contact MPSC Technical Support @ +1-800-394-1625 option 5.

**Issue: HeRO window is not displayed on my ECG monitor screen.**

**Resolution:** *Change the screen layout on the ECG monitor to include a screen that has the dedicated HeRO window displayed.*

**Issue: HeRO application is not displayed in the dedicated window on the ECG monitor screen.**

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**Resolution:** Select the HeRO SmartKey button in the toolbar at the bottom on the ECG monitor screen to start the HeRO application.

**Issue: HeRO application is not displayed in the dedicated window on the ECG monitor screen, and the HeRO SmartKey is not displayed in the toolbar.**

**Resolution:** Manually start the iPC via the Philips menu (Main Setup/Internal PC/Switch PC On). Ensure that the Intellivue MX monitor is configured to automatically start the iPC when the monitor is powered up. (Enter config mode, then select Main Setup/Hardware/Internal PC/Auto Start PC/Enabled.)

**Issue: The data acquisition light is not green, so the system is not collecting data.**

**Resolution 1:** Verify the patient monitor is monitoring a connected patient.

**Resolution 2:** Modify the ECG lead placement on the patient.

**Issue: The data acquisition light is green, but I am not getting a HeRO score.**

**Resolution 1:** Click on the HeRO bed to open the Patient View and verify more than 4 hours of continuous historical data exists for the patient. If not, allow the system to collect more data and check for a HeRO score after 4 hours of data collection.

**Resolution 2:** Verify the patient's heart rate is above 80bpm. The lower operating limit of HeRO is 80bpm, so the collected heart rate must consistently be above the lower limit to create a HeRO score. (Note: The HeRO system will create a score once the heart rate consistently stays above the lower limit.)

**Issue: A "COMM Error" message is displayed for the HeRO bed on the ECG monitor.**

**Resolution 1:** Restart the iPC.

**Issue: A "COMM Error" message is displayed for the HeRO bed on the viewing station in a HeRO ES Embedded installation.**

**Resolution 1:** Turn on the ECG monitor, or take it out of Standby mode.

**Issue: Patient information (Name & MR#) is not displayed.**

**Resolution 1:** Verify the patient information is entered on the physiological monitor, and the patient has been admitted to the monitor.

**Issue: A "Server Communication Error" message is displayed at the bottom of the screen on the viewing station in a HeRO ES Embedded installation.**

**Resolution 1:** Restart the viewing station.

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## **Replacement Parts**

If you are in need of replacement parts for any of the HeRO systems, please contact MPSC Technical Support at +1-800-394-1625 option 5.