Sketch™

⬧ MASIMO

These operating instructions provide the necessary information for proper operation of all models of Sketch. There may be information provided in this manual that is not relevant for your system. General knowledge of pulse oximetry and an understanding of the features and functions of Sketch are prerequisites for its proper use. Do not operate Sketch without completely reading and understanding these instructions.

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Contents

About This Manual

This manual explains how to set up and use Sketch™. Important safety information relating to general use of Sketch appears in this manual. Read and follow any warnings, cautions, and notes presented throughout this manual. The following are explanations of warnings, cautions, and notes.

A *warning* is given when actions may result in a serious outcome (for example, injury, serious adverse effect, death) to the patient or user.

WARNING: This is an example of a warning statement.

A *caution* is given when any special care is to be exercised by the patient or user to avoid injury to the patient, damage to this device, or damage to other property.

CAUTION: This is an example of a caution statement.

A *note* is given when additional general information is applicable.

Note: This is an example of a note.

Product Description, Intended Use, and Contraindications

Product Description

Sketch™ is a standalone software tool used to connect a Masimo device with built-in network connectivity technology to a network. The tool is compatible with the following Masimo devices:

- Root/Root with NIBPT (Noninvasive Blood Pressure and Temperature)

- Radical-7

- Rad-97

Key Features

Sketch consists of the following features:

- Configuration of network settings on a Masimo device with network connectivity capability.

Safety Information, Warnings and Cautions

WARNING: Patient monitoring must be suspended while configuring settings on the monitoring device.

WARNING: Do not connect Sketch to a device that is actively monitoring a patient to avoid potential changes in device behavior.

CAUTION: Read the Radical-7, Rad-97, and/or Root operator's manual, accessories directions for use, all precautionary information, and specifications before use.

CAUTION: Confirm connections and settings before using Sketch in order to ensure proper communication to the connected device.

CAUTION: Verify all settings before implementing any changes to avoid potential changes in expected device behavior.

CAUTION: Incorrect communication port setting may result in no or delayed configuration of setting.

CAUTION: Devices connected through a network may be affected by network changes. Check network settings if devices do not communicate through the network.

Note: When connecting devices through a network connection, confirm the connecting devices are on the same network.

Chapter 1: Description

Overview

Sketch™ is a software application installed on a host computer to configure Masimo devices to connect to a network.

Note: For complete information on setup and use, refer to the Operator's Manual or Directions For Use for the host computer.

Note: Sketch is not a diagnostic tool.
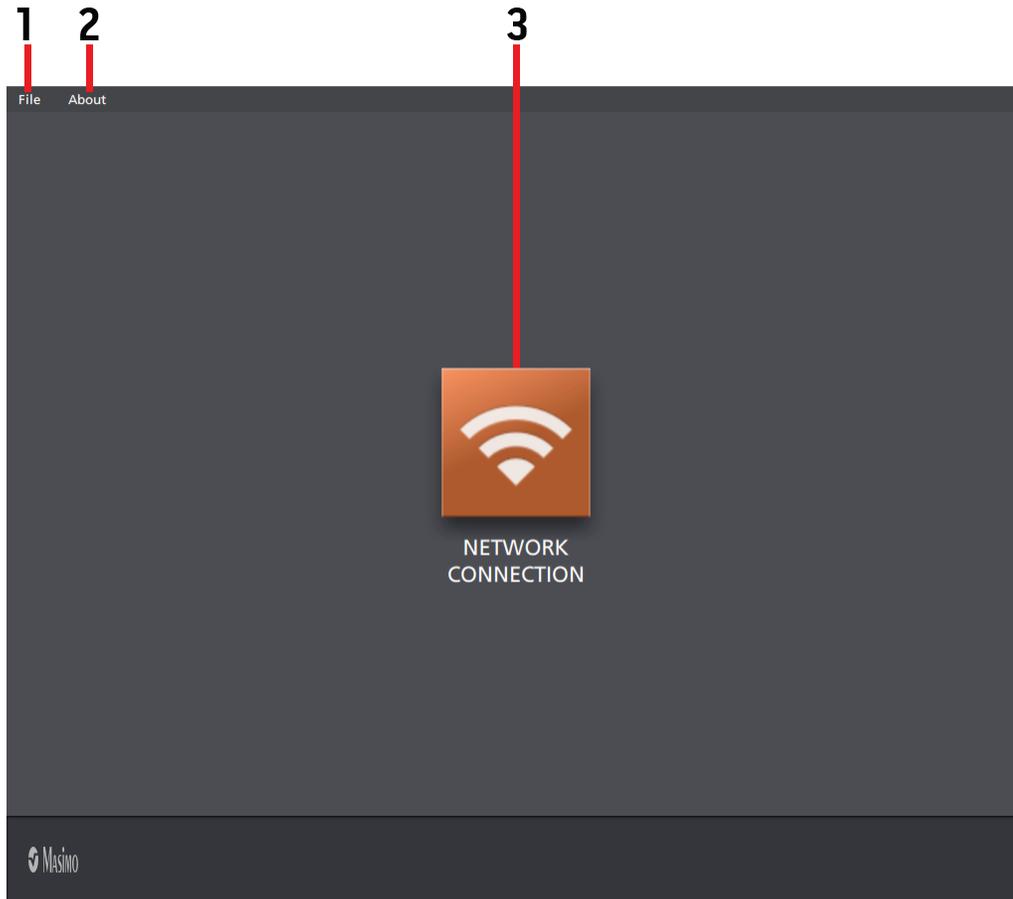
Ref	Name	Description
1	**File**	Click **File** then select **Exit** to close the Sketch application.
2	**About**	Displays the Sketch application software version.
3	**Network Connection**	• Connects Sketch to a Masimo device • Configures a Masimo device to connect to a network.

Serial and Network Cables

The cables listed below are used to connect Masimo devices to the Sketch host computer. If an adapter is required, it must be purchased separately.

Description	Image
Root/Root with NIBPT and Rad-97 *USB-Null Modem Cable*	
Radical-7 (docked to RDS) *USB-to-Serial Adapter*	
Root/Root with NIBPT and Rad-97 *Ethernet Cable*	

Chapter 2: Installing and Uninstalling Sketch

The host computer must have a minimum of Windows 7 and at least one USB port to install Sketch.

Installing Sketch

To install Sketch on a host computer:

1. Remove the USB from the packaging.

2. Insert the USB into a USB port on the host computer.

3. Locate the *setup.exe* file.

4. Double-click the *setup.exe* file to start the installation process.

5. By default a Desktop Shortcut to Sketch is created. If this is not desired, uncheck the box next to "Create a desktop shortcut". Click **Next** to continue.

6. Click **Install** to continue with the installation, or click **Back** to review or change any settings.

7. By default, the check box to "Launch Sketch" is selected (de-select if desired).

8. When Sketch is installed, click **Finish**. The Sketch application will open.

Uninstalling Sketch

To remove Sketch from a host computer:

1. Locate the Sketch *uninstall.exe* file in *C:\Program Files\MasimoSketch*.

2. Double-click the Sketch *uninstall.exe* file to start the process to uninstall Sketch.

3. Click **Yes** to completely remove Sketch and all of its components, or click **No** to cancel.

4. Click **OK** after Sketch has been successfully removed.

Viewing Sketch Software Version

To view the Sketch software version installed on the host computer:

1. Open the Sketch application.

2. In the Sketch menu bar, click **About**. The drop-down menu displays the Sketch software version.

Chapter 3: Setting Up

Connecting the Sketch Host Computer to a Masimo Device

This chapter explains how to connect the Sketch host computer to a Masimo device using either serial or network connectivity. After establishing a connection, Sketch can be used to configure a Masimo device to connect to a network.

- See **Serial Connectivity** on page 15. See *When to Use Serial Connectivity* below.

- See **Network Connectivity** on page 18. See *When to Use Network Connectivity* below.

When to Use Serial Connectivity

- Use serial connectivity when using a USB or RS-232 to connect the Sketch host computer to a Masimo device.

- Serial connectivity is required to configure a Masimo device that has not yet been configured for network connection.

- Serial connectivity can be used to re-configure an existing network connection on a Masimo device.

When to Use Network Connectivity

- Network connectivity can be used to remotely connect the Sketch host computer to a Masimo device.

- Network connectivity can be used to re-configure an existing network connection on a Masimo device.

Serial Connectivity

- See **Root/Root with NIBPT and Rad-97 Serial Connectivity** on page 15.

- See **Radical-7 Serial Connectivity** on page 17.

Root/Root with NIBPT and Rad-97 Serial Connectivity

Complete the instructions below to connect Root/Root with NIBPT or Rad-97 to the Sketch host computer using serial connectivity.

1. Connect the USB-Null Modem Cable between the Masimo device and the Sketch host computer. See the example setups below. For more information about cables, see **Serial and Network Cables** on page 12.

Root/Root with NIBPT   Host Computer

Rad-97   Host Computer

USB-Null
Modem Cable

USB-Null
Modem Cable
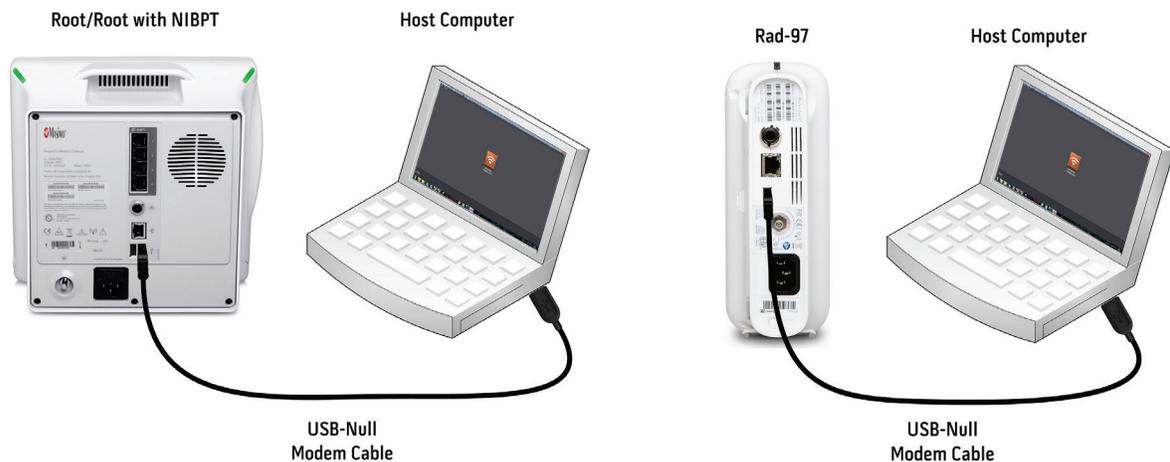
2.   On the Masimo device home screen, press the **Main Menu** options icon ⚙.

3.   Select **Device Settings** 🔲.

4.   Select **Device Output** 📲.

5.   In the **Device Output** screen, for USB Port, select **IAP**, then press **OK**.

6.   Set the baud rate:

   •   Press the back button ⬅ to go back to the **Device Settings** menu.

   •   Select **Access Control** 🔑.

   •   Press the 123 key.

   •   When the numeric screen displays, enter the following numbers: **6 2 7 4**

   •   Press **Enter** ⏎.

   •   In the **Access Control** menu, select a **Baud Rate**. For more information about baud rates, see the Masimo device operator's manual and *Appendix A: Device Baud Rates* on page 35.

   •   Power cycle the device if the baud rate is changed.

7.   Sketch host computer serial connectivity with the Masimo device is complete. To configure network settings in the Masimo device, see ***Network Connection Feature*** on page 19.

Radical-7 Serial Connectivity

Complete the instructions below to connect Radical-7 to the Sketch host computer using serial connectivity.

1. Power ON the Radical-7.

2. Snap the Radical-7 into the docking station.

3. Connect the USB-to-Serial Adapter between the docking station and the Sketch host computer. See the example setup below. For more information about cables, see **Serial and Network Cables** on page 12.

Radical-7 in Docking Station   **Host Computer**

USB-to-Serial Adapter
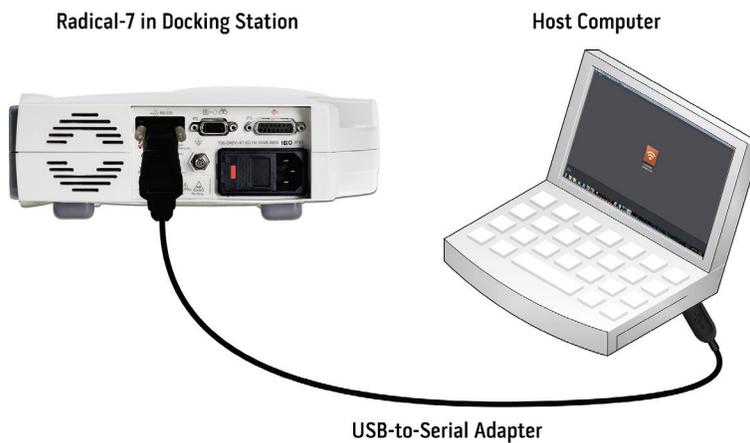
4. On the Radical-7 home screen, press the **Main Menu** options icon ⚙.

5. Select **Device Settings** .

6. Select **Device Output** .

7. In the **Device Output** screen, set the serial output protocol and baud rate.

   • In the **serial** field, select either **Data Collection** or **IAP** output (only one will be available).

   • Scroll to the bottom of the screen and select a baud rate. If no baud rate selection is available, then the following baud rates are automatically applied (see **Appendix A: Device Baud Rates** on page 35):

      • **Data Collection**: 57600

      • **IAP**: 9600

8. At the bottom of the **Device Output** screen, press **OK**.

9. Sketch host computer serial connectivity with the Masimo device is complete. To configure network settings in the Masimo device, see **Network Connection Feature** on page 19.

Network Connectivity

- See ***Root/Root with NIBPT and Rad-97 Hard-Wired Network Connectivity*** on page 18 below.

- See ***Root/Root with NIBPT, Rad-97, and Radical-7 Wireless Network Connectivity*** on page 18 below.

Root/Root with NIBPT, Rad-97, and Radical-7 Wireless Network Connectivity

Complete the instructions below to connect Root/Root with NIBPT, Rad-97, or Radical-7 to the Sketch host computer using wireless network connectivity.

1. If the Masimo device is already connected to a wireless network, go to step 2. If the Masimo device is NOT connected to a wireless network, see either ***Root/Root with NIBPT and Rad-97 Serial Connectivity*** on page 15 or ***Radical-7 Serial Connectivity*** on page 17.

   Note: The WiFi icon on the Masimo device home screen is blue when connected to a wireless network 📶 .

2. Setup the Sketch host computer to connect to the same wireless network as the Masimo device.

3. Sketch host computer network connectivity with the Masimo device is complete. To configure network settings in the Masimo device, see ***Network Connection Feature*** on page 19.

Root/Root with NIBPT and Rad-97 Hard-Wired Network Connectivity

Complete the instructions below to connect Root/Root with NIBPT or Rad-97 to the Sketch host computer using hard-wired network connectivity.

1. Use Ethernet cables to connect the Masimo device and host computer to a hard-wired network. For more information about cables, see ***Serial and Network Cables*** on page 12.

   Note: The Ethernet icon on the Masimo device home screen is blue when connected to a hard-wired network 🖧 .

2. Sketch host computer serial connectivity with the Masimo device is complete. To configure network settings in the Masimo device, see ***Network Connection Feature*** on page 19.

Chapter 4: Operation

Network Connection Feature

The **Network Connection** feature is used to configure a Masimo device to connect to a network. See **Configuring Root/Root with NIBPT, Rad-97, and Radical-7 to a Network** on page 19 below.

Configuring Root/Root with NIBPT, Rad-97, and Radical-7 to a Network

Complete the instructions below to configure Root/Root with NIBPT, Rad-97, or Radical-7 to connect to a network. These instructions assume that Sketch is properly installed on a host computer and connected to a Masimo device. See **Installing and Uninstalling Sketch** on page 13 and **Connecting the Sketch Host Computer to a Masimo Device** on page 15.

1. Open the Sketch application.

2. Click **Network Connection** .

3. Enter the desired network settings that will be exported to the Masimo device:

   - Enter network SSID (network name).

   - Enter network password.

     Note: Network password is not required for open networks.

4. Click **Next** .

5. Under **DEVICE**, select either **Root**, **Rad 97**, or **Radical-7**.

6.   Under **CONNECTION TYPE**, select either **Serial** or **IP Address**:

If Serial is selected:

- Select a **COM PORT**. If a COM port does not appear in the drop-down list check the serial cable connections and click the refresh button next to the **COM PORT** drop-down arrow.

- Select a **BAUD RATE**. The selected baud rate must match the baud rate setting in the Masimo device. To view the baud rate setting in a Masimo device:

   - See step 6 in *Root/Root with NIBPT and Rad-97 Serial Connectivity* on page 15, or

   - See step 7 in *Radical-7 Serial Connectivity* on page 17.
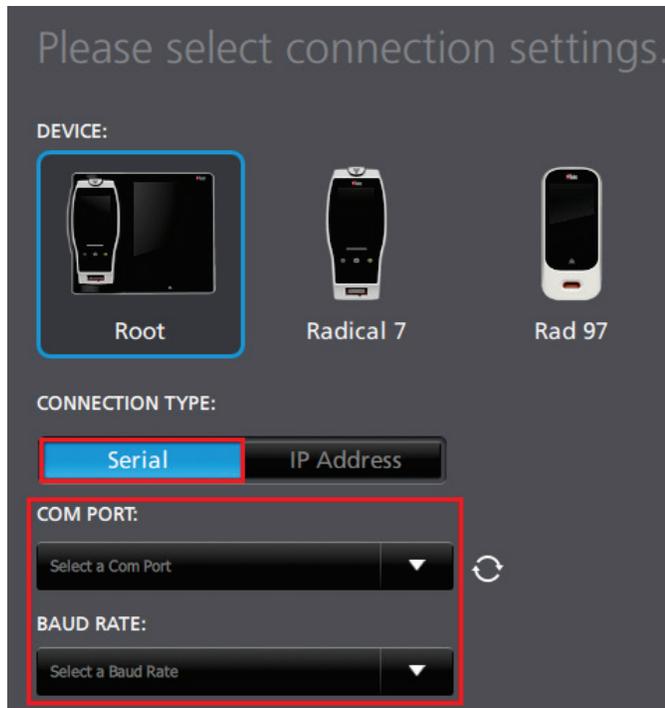
If IP Address is selected:

- Enter the Masimo device IP address:

   - On the Masimo device home screen, press the **Main Menu** options icon.

   - Select device settings.

   - Select either **Ethernet** or **WiFi**.

- Copy the IP address.
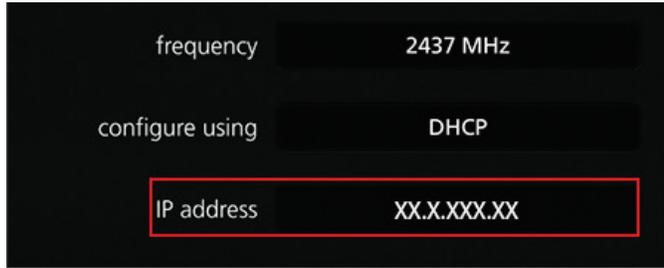
- In Sketch, enter the IP address in the **IP ADDRESS** box.
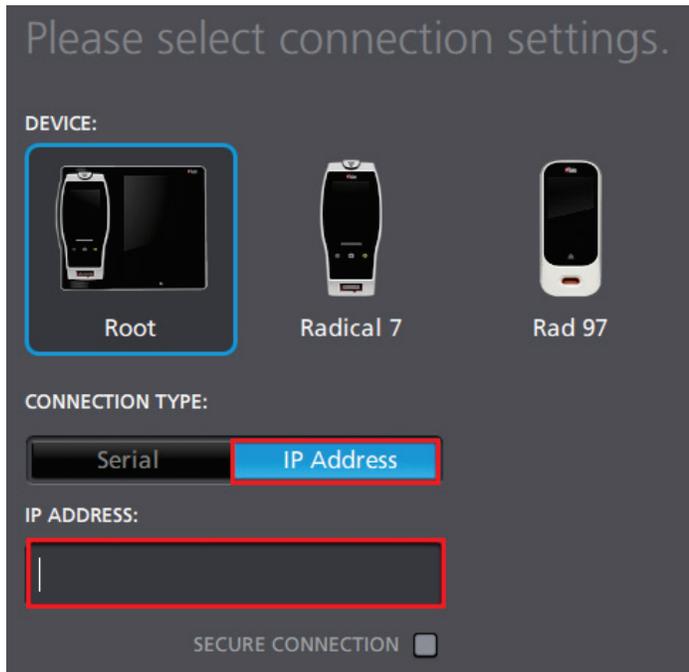
- Below the **IP ADDRESS** box, select or de-select the **Secure Connection** option:

  - For Rad-97, always SELECT the Secure Connection option .
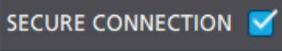
  - For Radical-7, DE-SELECT the Secure Connection option .

  - For Root/Root with NIBPT, DE-SELECT the Secure Connection option .
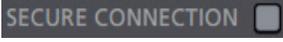
  Note: The Radical-7 or Root/Root with NIBPT may or may not be configured for a secured connection. If the export fails, SELECT the Secure Connection option and try exporting again.

7. Click **Export** . A message box will display *Sent Successfully* if the export was successful.

8. Verify the desired network setting has been established in the Masimo device:

  - Restart the device.

- Press **Main Menu** options ⚙.

- Select **Device Settings** 🖼️.

- Select **WiFi** 📶. The exported network SSID (network name) will appear in the **WiFi** menu indicating the device is connected to the desired network.

  Note: The WiFi icon on the Masimo device home screen is blue when connected to a wireless network 📶 .

Chapter 5: Messages

Messages

The following section lists common error messages, their potential causes, and next steps.

Message	Potential Causes	Next Steps
Error: Unable to communicate to instrument	• Device selected in Sketch connection settings is incorrect. • Device baud rate setting does not match with Sketch baud rate setting. • Device output setting is incorrect. • *Secure Connection* option selected/de-selected. • Communication cable is not properly connected.	• Check device selected in Sketch connection settings. • Check device output settings. • Check communication cable connection. • Check baud rates match within Sketch and device. • Select/de-select the *Secure Connection* option. • Attempt to reconnect by restarting device and Sketch.
Error: Device protocol version not supported	• Radical-7 software version is outdated.	• Upgrade software version to 1.5.5.8 or higher. Contact Masimo Technical Services. See ***Masimo Technical Services*** on page 29.

Chapter 6: Troubleshooting

Troubleshooting

The following section lists possible Sketch symptoms, potential causes, and next steps.

Symptom	Potential Causes	Next Steps
Sketch does not successfully install in host computer	• Incompatible operating system	• Verify the operating system is minimum Windows 7. See **Supported Platforms** on page 27. • Contact Masimo Technical Services. See **Masimo Technical Services** on page 29.
Sketch application does not open	• Software installation unsuccessful • Incompatible operating system.	• Verify the operating system is minimum Windows 7. See **Supported Platforms** on page 27. • Contact Masimo Technical Services. See **Masimo Technical Services** on page 29.
Sketch does not communicate with device through serial connection	• External device is not compatible. • Device output settings are not configured correctly. • Communication cable is not properly connected.	• Check external device compatibility. • Attempt to reconnect by restarting Sketch. • Check device output settings. • Check communication cable connection. • Check serial port connections. • Check Baud rates match within Sketch and device. • Contact Masimo Technical Services. See **Masimo Technical Services** on page 29.
Sketch does not communicate with device through hard-wired network connection	• External device is not compatible. • Ethernet is not turned on and/or not correctly configured. • Location does not have network availability. • Connected network is not available. • Secured/unsecured network connection • Internal failure.	• Check external device compatibility. • Attempt to reconnect by restarting Sketch. • Check that the Ethernet feature is ON and correctly configured. • Check network settings and availability. • Check network connection. • Check correct IP address is in Sketch setup connection. • Check *Secured Connection* is selected/deselected. • Contact Masimo Technical Services. See **Masimo Technical Services** on page 29.
Sketch does not communicate with device through wireless network connection	• External device is not compatible. • Wi-Fi is not turned on and/or not correctly configured. • Location does not have wireless and/or network availability. • Connected network is not available. • Secured/unsecured network connection • Internal failure.	• Check external device compatibility. • Attempt to reconnect by restarting Sketch. • Check that the Wi-Fi feature is ON and correctly configured. • Check wireless availability for location. • Check network settings and availability. • Check network connection. • Check *Secured Connection* is selected/deselected. • Check correct IP address is in Sketch setup connection. • Contact Masimo Technical Services. See **Masimo Technical Services** on page 29.
COM port not displayed in drop-down list	• The serial cable is not connected to host computer • The serial cable was connected to the host computer after entering SSID and password and clicking to go to the connection settings screen.	• Connect the serial cable to the host computer and device and click the refresh icon.

Chapter 7: Specifications

Minimum Requirements

Sketch works on the following Windows Operating Systems:

Windows 7 (Minimum Requirement)
Windows 8
Windows 10

Sketch Symbols

The following symbols may appear on the product or product labeling:

Symbol	Description	Symbol	Description
	Follow instructions for use		Consult instructions for use
	Separate collection for electrical and electronic equipment (WEEE)	**REF**	Catalog number (model number)
	Recyclable	LOT	Lot code
	Instructions/Directions for Use/Manuals are available in electronic format @http://www.Masimo.com/TechDocs **Note: eIFU is not available for CE mark countries.**		

Chapter 8: Service and Maintenance

Return Procedure

Clean contaminated/dirty equipment before returning, following instructions in Cleaning. Make sure the equipment is fully dry before packing. Call Masimo at 800-326-4890 and ask for Technical Support. Ask for an RMA number. Package the equipment securely, in the original shipping container if possible, and enclose or include the following information and items:

- A letter describing in detail any difficulties experienced with the Sketch. Include the RMA number in the letter.

- Warranty information, a copy of the invoice or other applicable documentation must be included.

- Purchase order number to cover repair if the Sketch is not under warranty, or for tracking purposes if it is.

- Ship-to and bill-to information.

- Person (name, telephone/Telex/fax number, and country) to contact for any questions about the repairs.

- A certificate stating the Sketch has been decontaminated for bloodborne pathogens.

- Return the Sketch to the shipping address listed in **Contacting Masimo** on page 29 below.

Masimo Technical Services

To contact Masimo Technical Services, refer to the Masimo Technical Services web page:

http://www.masimo.co.uk/company/global-services/technical-services/

Contacting Masimo

Masimo Corporation
52 Discovery
Irvine, California 92618

Tel:+1 949 297 7000
Fax:+1 949 297 7001

Limited Warranty

Masimo warrants to the original end-user purchaser the Masimo-branded hardware product (Sketch™) and any software media contained in the original packaging against defects in material and workmanship when used in accordance with Masimo's user manuals, technical specifications, and other Masimo published guidelines for a period of 12 months and any batteries for six (6) months from the original date the Product was obtained by the end-user purchaser.

Masimo's sole obligation under this warranty is the repair or replacement, at its option, of any defective Product or software media that is covered under the warranty.

To request a replacement under warranty, Purchaser must contact Masimo and obtain a returned goods authorization number so that Masimo can track the Product. If Masimo determines that a Product must be replaced under warranty, it will be replaced and the cost of shipment covered. All other shipping costs must be paid by purchaser.

Exclusions

The warranty does not apply to any non-Masimo branded product or any software, even if packaged with the Product, or any Product that was: (a) not new or in its original packaging when supplied to purchaser; (b) modified without Masimo's written permission; (c) supplies, devices, or systems external to the Product; (d) disassembled, reassembled, or repaired by anyone other than a person authorized by Masimo; (e) used with other products, like new sensors, reprocessed sensors, or other accessories, not intended by Masimo to be used with the Product; (f) not used or maintained as provided in the operator's manual or as otherwise provided in its labeling; (g) reprocessed, reconditioned, or recycled; and (h) damaged by accident, abuse, misuse, liquid contact, fire, earthquake or other external cause.

No warranty applies to any Product provided to Purchaser for which Masimo, or its authorized distributor, is not paid; and these Products are provided AS-IS without warranty.

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Warranty

Masimo warrants to the initial buyer only that these products, when used in accordance with the directions provided with the Products by Masimo, will be free of defects in materials and workmanship for a period of six (6) months. The foregoing is the sole and exclusive warranty applicable to the products sold by Masimo to buyer. Masimo expressly disclaims all other oral, express or implied warranties, including without limitation any warranties of merchantability or fitness for particular purpose. Masimo's sole obligation and buyer's exclusive remedy for breach of any warranty shall be, at Masimo's option, to repair or replace the product.

Warranty Exclusions

This warranty does not extend to any product that has been used in violation of the operating instructions supplied with the product, or has been subject to misuse, neglect, accident or externally created damage. This warranty does not extend to any product that has been connected to any unintended instrument or system, has been modified, or has been disassembled or reassembled. This warranty does not extend to sensors or patient cables that have been reprocessed, reconditioned or recycled.

In no event shall Masimo be liable to buyer or any other person for any incidental, indirect, special or consequential damages (including without limitation lost profits), even if advised of the possibility thereof. In no event shall Masimo's liability arising from any products sold to buyer (under a contract, warranty, tort or other claim) exceed the amount paid by buyer for the lot of product(s) involved in such claim. In no event shall Masimo be liable for any damages associated a product that has been reprocessed, reconditioned or recycled. The limitations in this section shall not be deemed to preclude any liability that, under applicable products liability law, cannot legally be precluded by contract.

Appendix A: Compatible Masimo Devices

The following Masimo devices are compatible with Sketch:

Device	Minimum Software Level Requirement
Radical-7	v1.5.5.8 or above
RDS	v5.1.3.2 or above
Root and Root with noninvasive blood pressure and temperature (NIBPT)	v1.5.6.9 or above
Rad-97	v1.1.3.3 or above

Appendix B: Device Baud Rates

Device	Communication Protocol	RDS Version*	Available Maximum Baud Rates
Radical-7* docked to RDS	IAP	V1	9600**
		V2	9600, 19200, 28800, 38400, 57600
	Data Collection	NA	57600**
Root/Root with NIBPT	IAP	NA	9600, 19200, 38400, 57600, 115200, 230400, and 921600
Rad-97	IAP	NA	9600, 19200, 38400, 57600, 115200, 230400, and 921600

* Radical-7 must have software v1.5.5.8 or higher to allow identification of the RDS version.

** Baud rate is non-adjustable.

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