

Sensormedics Vmax with ECG

Tango M2 Interface Notes

The Sensormedics Vmax can be configured to work with the following models of ECG stress systems:

- GE CASE
- GE Cardiosoft software
- MAX-1
- SMC 3-lead

The Tango M2 can be set-up with the Vmax using the directions listed below, choose the model of ECG that your Vmax system has and follow set-up instructions.

Note: In order to use the Tango M2 with the Vmax, the Vmax and its ECG programs must be running simultaneously.

With regards to the hardware (cabling), all of the systems will specify ECG trigger and RS-232 cables. The ECG trigger cable is required for the Tango M2 monitor to be able to take a BP measurement. This cable allows the Tango M2 to receive r-wave trigger communication from the stress system. The RS-232 serial cable is used to establish communication between the Tango M2 and the Vmax. This cable allows your stress system to prompt the Tango M2 when it needs a BP measurement. In addition, it allows the BP measurements taken by the Tango M2 to be transferred to the Vmax display and reports.

Please note that when available SunTech part numbers are provided for cables and when available related Sensormedics part numbers are also specified.

Vmax with GE CASE and TangoM2 (Sensormedics P/N 773720-10X)

The Vmax with CASE solution includes the following key components needed for communication:

- Tango M2 without Internal ECG
- RS-232 Serial Cable, Tango M2 to CASE
 - SunTech P/N 91-0013-01 or Vmax P/N 464695
- ECG Trigger cable, from splitter cable to Tango M2 BNC
 - SunTech P/N 91-0009-01 or Vmax P/N 465409
- ECG "Splitter" Cable from CASE ANA/TTL port to Tango M2 BNC and Vmax Pod
 - SunTech P/N 91-0053-01 or Vmax P/N P/N 465943
- Analog ECG cable from splitter cable to Vmax ECG port on Pod
 - Vmax P/N 769811
- RS-232 Serial cable from CASE (Com1 or 2), to Vmax
 - SunTech P/N 91-0013-01 or Vmax P/N 464695

1. Connect the following using the specified cables:

- RS-232 Serial cable, from CASE Com 2 to Vmax Computer Com 1
- RS-232 Serial Cable, from CASE Com 1 to Tango M2 RS-232 port
- ECG Trigger Cable, from Tango M2 BNC port to ECG Splitter Cable
- ECG Splitter Cable, from ANA/I/O ECG Out on CASE to
 - a. Analog ECG Cable - splitter to Vmax Pod *AND*
 - b. ECG Trigger Cable - splitter to Tango M2 BNC.

2. Setting up the Tango M2 monitor:

- a. When the main screen is displayed, press the **SELECT** button once. You should be in the **MAIN MENU**. Use the UP or DOWN arrows, go to **MONITOR SET UP**. Press the **SELECT** button.
- b. Use the UP or DOWN arrow buttons to highlight **STRESS SYSTEM**. Press the **SELECT** button once. Use UP or DOWN arrows until **Case (GE)** is highlighted and press the **SELECT** button to confirm the choice.
- c. Use UP or DOWN arrows to select **EXIT** as needed to return to the main operating screen.

3. Setting up the CASE

- a. In the vertical menu bar on the right side, select **System Configuration**.
- b. In the System Configuration screen, click on the **Devices** tab on the top.
- c. Check that the **Treadmill** is set to **Series 2000** and that its **Port** is set to **COM A**.
- d. Go to **BP Monitor** and select **SunTech**, and for its **Port**, choose COM port 1.
- e. Ensure that there is a check mark by **Send Exercise Data**, the remaining **Port** setting is set to **COM 2**, and that **Analog 1** is set to **V5 1V/mv**.
- f. Ensure that the **TTL Output** is set to a **Pulse Width: 50ms, Delay: 0ms**, and **Polarity: Positive**.
- g. Click **OK** to return to the main screen.

4. Setting up the Vmax:

- a. In the Vmax protocol settings, set **ECG** to **Serial 1-Marquette**.

Vmax with CardioSoft and Tango M2 (Sensormedics P/N 772536-10X)

The Vmax with CardioSoft solution includes the following key components needed for communication:

- Tango M2 with Internal ECG
- RS-232 serial Cable, Tango M2 to PC:
 - SunTech P/N 91-0013-01 or Vmax P/N 464695
- ECG Trigger Cable, Vmax Pod to Tango M2 ECG Port:
 - Vmax P/N 772539

1. Connect the following using the specified cables:

- Parallel cable, from Corina to PC Boca (standard connection to Vmax)
- Analog cable from, Corina to ECG Port of Vmax Pod (standard connection to Vmax- P/N 771597)
- RS-232 Serial cable, from Tango M2 port to PC (Com1 or Com 2)
- ECG Trigger cable, from Vmax Pod Analog out Channel E to Tango M2 ECG port

2. Setting up the Tango M2 monitor:

- a. When the main screen is displayed, press the **SELECT** button once. You should be in the **MAIN MENU**. Use the UP or DOWN arrows, go to **MONITOR SET UP**. Press the **SELECT** button.
- b. Use the UP or DOWN arrow buttons to highlight **STRESS SYSTEM**. Press the **SELECT** button once. Use UP or DOWN arrows until **CardioSys** is highlighted and press the **SELECT** button to confirm the choice.
- c. Use UP or DOWN arrows to select **Exit** as needed to return to the main operating screen.

3. Setting up the Vmax

- h. From the VMax Program Manager Screen, click on **Special Functions**.
- i. In the Select Patient window, click on **un-named**.
- j. Click on the **Wrench**
- k. Click **Systems Configuration**
- l. Click on the **Devices** tab
- m. Under **BP Monitor** select
 - **SunTech**
 - COM port used in step 2, **COM 1** or **2**
- n. Click **OK**
- o. Click on the **Exit** icon at the top of the screen
- p. Quit the program
- q. Click **ESC** to go back to the VMax Program Manager Screen
- r. Next, setup the Vmax by choosing the appropriate exercise protocol (10 watt ramp/External treadmill, etc...). Click on **Exercise Metabolic Test** and choose the protocol from the **Metabolic Study Window**.
- s. Click on **F10**
- t. Under **Signal Out**, choose **Analog Group 3**
- u. Click **F3** to save the settings
- v. Repeat steps k-n for any other protocols.

Vmax with MAX-1 and Tango M2 (Sensormedics P/N 772537-10X)

The Vmax with MAX-1 solution includes the following key components needed for communication:

- Tango M2 without Internal ECG
- RS-232 serial Cable, Tango M2 to MAX-1
 - Vmax P/N 465410
- RS-232 serial Cable, MAX-1 Com 2 to Computer Com 1
 - Vmax P/N 463087
- ECG Splitter Cable, from MAX-1 ANA/TTL port to Tango M2 BNC port and Vmax ECG port on Pod
 - SunTech P/N 91-0053-01 or Vmax P/N P/N 465943
- Analog ECG Cable, from Splitter to Vmax Pod, (standard MAX-1 to Vmax Pod cable)
 - Vmax PN 769811
- ECG Trigger Cable, from Splitter to Tango M2 BNC
 - SunTech P/N 91-0009-01 or Vmax P/N 465409

1. Connect the following using the specified cables:

- RS-232 Serial cable from MAX-1 Com2 port (CRT) to Computer Com 1
- RS-232 Serial Cable, from Tango M2 port to COM1 port on CRT of MAX-1
- ECG Splitter Cable, from ANA/I/O ECG Out on CASE to
 - a. Analog ECG cable, P/N 769811, to Vmax ECG port on Pod *AND*
 - b. ECG Trigger Cable - splitter to Tango M2 BNC.

1. Setting up the Tango M2 monitor

- a. When the main screen is displayed, press the **SELECT** button once. You should be in the **MAIN MENU**. Use the UP or DOWN arrows, go to **MONITOR SET UP**. Press the **SELECT** button.
- b. Use the UP or DOWN arrow buttons to highlight **STRESS SYSTEM**. Press the **SELECT** button once. Use UP or DOWN arrows until **Max-1** is highlighted and press the **SELECT** button to confirm the choice.
- c. Use UP or DOWN arrows to select **Exit** as needed to return to the main operating screen.

2. Setting up the MAX-1 (Note: requires software version 1D or greater OR 2E)

- a. At the Start Up screen, rotate the trim knob until the cursor is over the **MAIN MENU** and then press on the knob to bring up the Main Menu.
- b. Turn the trim knob to **SYSTEM SETUP**, and press it to select System Setup
- c. Use the trim knob to select **INPUTS/OUTPUTS**.
- d. Ensure that **Slow Analog Out** is set to **Not Used** and that **Fast Analog Out** is set to **II**. If not, use the trim knob to set them correctly.
- e. Use the trim knob to select **TTL OUTPUT** and set it to **QRS DETECT**.
- f. Turn the knob to **WIDTH** and press it to select it. Now turn the knob until **40 msec** is displayed. If you cannot select 40 ms, simply type 40, then press the knob.
- g. Turn the knob to **DELAY**, press it, and set the delay to **0 ms**. Press the knob again to set it.
- h. Go to **BP Device** and press the trim knob. Select **Suntech** and press the trim knob. If Suntech is not available, choose **MEI 1950**.
- i. Press the Escape Key (ESC) to leave this screen. The ESC key is located in the bottom left hand corner of the keyboard. Note: Do not use the return to exit this screen.
- j. Choose **SAVE SETUP**, then choose **SYSTEM**.

- k. Immediately go back and verify that your settings are still saved. If they are not saved, you will have to reset them and then exit this screen via the ESC key.
- l. Return to the Main Menu.

3. Setting up the Vmax

- a. In the Vmax protocol settings, set **ECG** to **Serial 1-Marquette**.

Vmax with SMC 3-Lead and Tango M2 (Sensormedics P/N 772538-10X)

The Vmax with SMC 3-Lead solution includes the following:

- Tango M2 with Internal ECG
- ECG Trigger Cable, Vmax to Tango M2 ECG
 - Vmax P/N 772539

1. Connect the following using the specified cables:

- Connect SMC 3-lead to ECG port on pod
- ECG Trigger cable from port E on Pod to Tango M2 BNC port

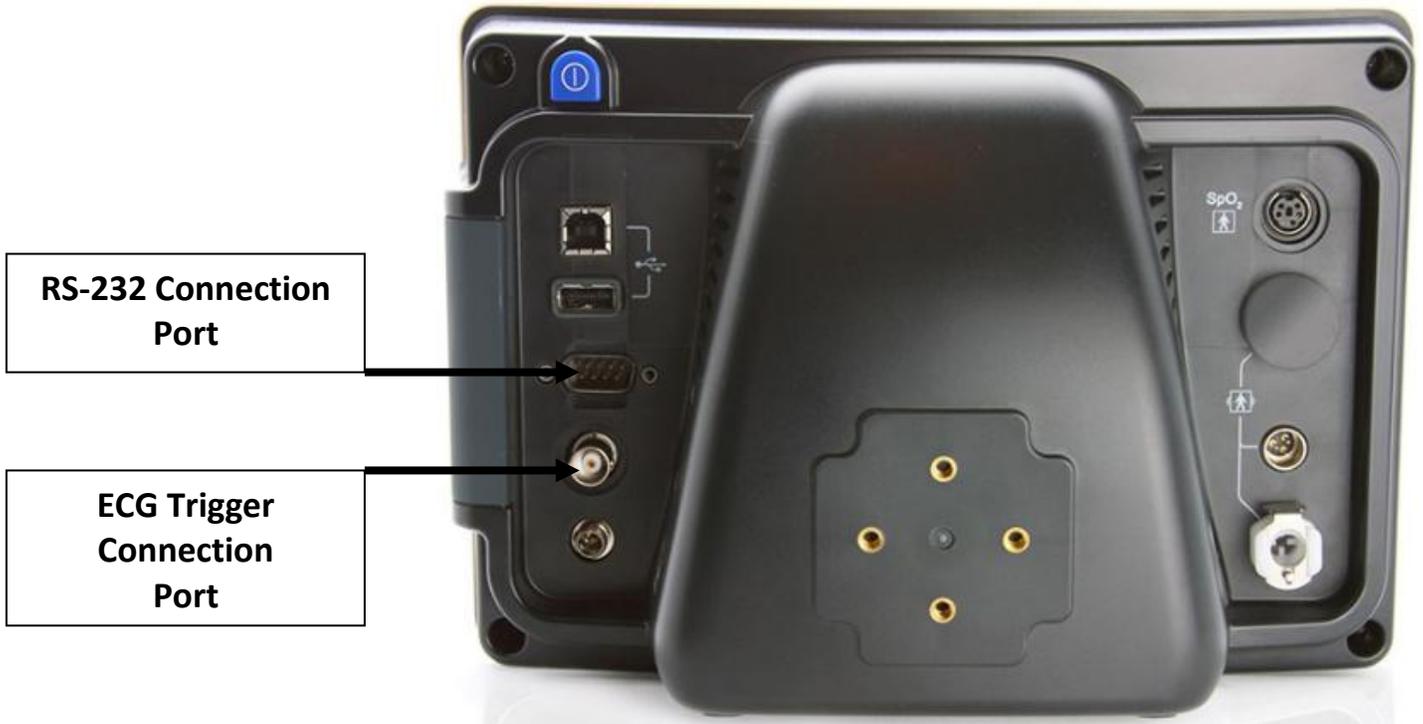
2. Setting up the Tango M2 monitor:

- a. When the main screen is displayed, press the **SELECT** button once. You should be in the **MAIN MENU**. Use the UP or DOWN arrows, go to **MONITOR SET UP**. Press the **SELECT** button.
- b. Use the UP or DOWN arrow buttons to highlight **STRESS SYSTEM**. Press the **SELECT** button once. Use UP or DOWN arrows until **CUSTOM** is highlighted and press the **SELECT** button twice to confirm the choice.
- c. Use UP or DOWN arrows and highlight **ECG TRIGGER**. Press the **SELECT** button and scroll to **INTERNAL**. Press the **SELECT** button and press the UP or DOWN and go to **EXIT**.
- d. Use UP or DOWN arrows to select **Exit** as needed to return to the main operating screen.

3. Setting up the Vmax

- a. In the Vmax protocol settings, set **ECG** to **SMC 3-Lead** and **Analog Out** to **Group 3**.

Tango M2 Monitor without Internal ECG



Tango M2 Monitor with Internal ECG

