Sensormedics Vmax with ECG
Tango Interface Notes

You can setup the Tango with the Sensormedics Vmax using the following directions. The Vmax can be configured to work with the following models of ECG

- Cardiosoft
- MAX-1
- SMC 3-lead
- CASE 8000

Choose the model of ECG that your Vmax system has and follow the directions below. Note that in order to use the Tango with the Vmax, the Vmax and its ECG programs must be running simultaneously.

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

Note that all part #'s specified are Sensormedics part #'s.

Vmax - Tango –CardioSoft (Sensormedics P/N 772536-10X)

The Vmax – Tango – CardioSoft solution includes the following:
- Tango with ECG
- Serial Cable, Tango to PC: P/N 464695
- Analog Cable, Vmax Pod to Tango ECG Port: 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)
   - Serial cable from Tango RS232 port to PC (Com1 or Com 2): P/N 464695
   - Analog cable: Vmax Pod Analog out channel E to Tango ECG Connector: P/N 772539

2. Setting up the Tango monitor
   a. Turn on the Tango using the switch at the rear top left corner of the Tango.
   b. Once the operating screen is displayed, press the *MENU*/SELECT button. Use the UP or DOWN buttons to select **Utilities** and press the menu button.
   c. Use the arrow buttons to select **Device** and press the MENU/*SELECT* button to edit. Choose **SUNTECH** using the arrow buttons and press the select button to confirm the choice.
   d. Select **ECG trigger** and press the select button to edit. Choose **INTERNAL** and press the select button to confirm the choice.
   e. Select **Exit** twice to return to the operating screen.

3. Setting up the Cardiosoft
   a. Click on the "running man" or "stress test" icon. This will present the **Retrieve Patient** screen.
   b. Select any patient and press **OK**. At the **Test Demographics** screen press **Cancel**.
   c. Select **Defaults** and proceed to **Page 2**.
   d. Select the **BP Monitor** as **BP METER 1**
   e. For **Port**, choose the COM port you have connected the cable to, generally **COM 2**.
   f. In protocol section, specify desired blood pressure interval. Remember that the BP measurement will be initiated one minute prior to the designated time.

4. Setting up the Vmax
   a. In the Vmax protocol settings, set ECG to **Cardiosoft** and Analog Out to **Group 3**.

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

The Vmax – Tango – MAX-1 solution includes the following:
- Tango without ECG
- Serial Cable, Tango to MAX-1: P/N 465410
- Splitter Cable, P/N 465943, from MAX-1 ANA/TTL port to Tango BNC port and Vmax ECG port on Pod
- Analog Cable, PN 769811, from Splitter to Vmax Pod, (standard MAX-1 to Vmax Pod cable)
- Digital ECG Cable, P/N 465409, from Splitter to Tango BNC

1. Connect the following using the specified cables:
   - Serial cable from MAX-1 Com2 port (CRT) to Computer Com 1 (standard connection to Vmax, P/N 463087).
   - Serial Cable, from Tango RS232 port to COM1 port on CRT of MAX-1, P/N 465410
   - Splitter Cable, P/N 465943, from MAX-1 ANA/TTL port to:
   - Analog cable, P/N 769811, to Vmax ECG port on Pod
   - Digital ECG Cable, P/N 465409, to Tango BNC port, P/N 465409.

2. Setting up the Tango monitor
   a. Turn on the Tango using the switch at the rear top left corner of the Tango.
   b. Once the operating screen is displayed, press the *MENU*/SELECT button. Use the UP or DOWN buttons to select **Utilities** and press the menu button.
   c. Use the arrow buttons to select **Device** and press the MENU/*SELECT* button to edit. Choose **MARQUETTE** using the arrow buttons and press the select button to confirm the choice.
   d. Select **ECG trigger** and press the select button to edit. Choose **DIGITAL↑** and press the select button to confirm the choice.
   e. Select **Exit** twice to return to the operating screen.

3. Setting up the MAX-1 (Note: requires software version 1D or greater OR 2E)
   a. Turn the power on to the Max-1.
   b. 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.
   c. Turn the trim knob to **SYSTEM SETUP**, and press it to select System Setup
   d. Use the trim knob to select **INPUTS/OUTPUTS**. A list of Inputs/Outputs will be listed on the screen.
   e. 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.
   f. Use the trim knob to select **TTL OUTPUT** and set it to **QRS DETECT**.
   g. 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 in 40 on the keyboard, then press the knob.

h. Turn the knob to **DELAY**, press it, and set the delay to **0 ms**. Press the knob again to set it.
i. Go to **BP Device** and press the trim knob. Select **Suntech** and press the trim knob. If Suntech is not available, choose **MEI 1950**.
j. 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.
k. Choose **SAVE SETUP**, then choose **SYSTEM**.
l. 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.
m. Return to the Main Menu.

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

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

The Vmax – Tango – SMC 3-Lead solution includes the following:
- Tango with ECG
- Analog Cable, Vmax to Tango ECG (P/N 772539)

1. Connect the following using the specified cables:
   - Connect SMC 3-lead to ECG port on pod
   - Analog cable out from port E on Pod to Tango ECG port: P/N 772539

2. Setting up the Tango monitor
   a. Turn on the Tango using the switch at the rear top left corner of the Tango.
   b. Once the operating screen is displayed, press the *MENU*/SELECT button. Use the UP or DOWN buttons to select **Utilities** and press the menu button.
   c. Select **ECG trigger** and press the select button to edit. Choose **INTERNAL** and press the select button to confirm the choice.
   d. Select **Exit** twice to return to the operating screen.

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

Vmax - Tango -Case 8000 (Sensormedics P/N 773720-10X)

The Vmax – Tango – Case 8000 solution includes the following:
1. Tango without ECG
2. Serial Cable, Tango to Case 8000 - P/N 464695
3. "Splitter" Cable from Case 8000 ANA/TTL port to Tango BNC and Vmax Pod - P/N 465943
4. Analog cable from splitter cable to Vmax ECG port on Pod (same cable as used in MAX-1 connection to Vmax, P/N 769811).
5. Digital ECG cable, P/N 465409, from splitter cable to Tango BNC (same cable as used in MAX-1/Tango alone configuration).
6. Serial cable from Case 8000 Com1 or 2, to Vmax (Same cable as used in Tango/CardioSoft configuration, P/N 464695

1. Connect the following using the specified cables:
   - P/N 464695, Serial cable from Case 8000 Com 2 to Vmax Computer Com 1.
   - P/N 464695, Serial Cable, Case 8000 COM 1 to Tango RS232
   - P/N 465943, Splitter Cable, from ANA/I/O ECG Out on Case 8000 to
     a) Analog ECG Cable, P/N 769811 - splitter to Vmax Pod and,
     b) Digital ECG Cable, P/N 465409 - splitter to Tango BNC.

2. Setting up the Tango monitor
   a. Turn on the Tango using the switch at the rear top left corner of the Tango.
   b. Once the operating screen is displayed, press the *MENU*/SELECT button. Use the UP or DOWN buttons to select **Utilities** and press the menu button.
   c. Use the arrow buttons to select **Device** and press the MENU/*SELECT* button to edit. Choose **SUNTECH** using the arrow buttons and press the select button to confirm.
   d. Select **ECG trigger** and press the select button to edit. Choose **DIGITAL↑** and press the select button to confirm the choice.
   e. Select **Exit** twice to return to the operating screen.

3. Setting up the Case 8000
   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
   c. In the Vmax protocol settings, set **ECG** to **Serial 1-Marquette**.