

# MIR-25

Part I Quick Start Guide

Part II Manual

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The Prometheus Group  
One Washington Street, Suite 303  
Dover, NH 03820

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# MR-25

# Quick- Start

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## **Indications for use:**

Surface electromyography is a safe and effective technique for relaxation training and muscle re-education.

Using internal perineometer electrodes such as the PerryVaginal: EMG biofeedback is a safe and effective technique for the assessment and treatment of pelvic floor dysfunction, monitoring the performance of Kegel exercises. The pelvic floor muscles include the Levator Ani group as well as the pubococcygeus (PC), ileococcygeus, and coccygeus. These are skeletal muscles which respond to re-education, strengthening, endurance building, and relaxation.

Conditions that can be assessed or treated using this technique include: stress incontinence, mixed incontinence, and urge incontinence.

Contraindications: Do not use this device for treatment of incontinence in the presence of any bladder infection, vaginal infection, or during pregnancy.

Caution: Federal law (USA) restricts this device for sale by or on the order of a licensed medical practitioner, licensed by law in the state in which they practice.

Caution: Federal law (USA) restricts this device to sale by or on the order of a physician when used for the treatment of incontinence.

Caution: Use only electrodes from The Prometheus Group with your Pathway surface EMG device. Any other electrode may not be compatible with the Pathway device.

### Warnings:

- Be sure to read this operator's guide before using this device.
- Do not put this device underwater or get device wet. It could damage the device.
- Use only batteries with this device, do not use any type of line-powered adapter.
- Do not connect any preamp, lead wire, electrode, or any other component to a wall outlet. Do not leave electrodes attached when device is not in use.
- For the treatment of incontinence do not attempt to use this device concurrently with stimulation being supplied from an electrical muscle stimulator.

## **CABLE CONNECTION FOR PRACTICE SESSION**

Connect gray preamp (Patient Cable) to channel “A”.

Snap Pathway Electrode onto the black molded end (with three snaps).

Place the Electrode on your flexor muscle of forearm.

(parallel with the muscle fibers; long edge of electrode will be same direction as arm).

Place on the “Belly” of the muscle.

**Turn the unit ON** by turning the **Thumbwheel** clockwise.

*Batt* indicator will light; **Battery Voltage will be displayed** for approx. 3 seconds in large window. **“Unlocked”** will flash.

*Session* indicator will light; **Session # will be displayed** in large window for approx. 3 seconds.

Unit will then default to its’ **“Measurement Mode”**. The unit is in **“Continuous”** mode meaning there are no Work/Rest intervals set.

*The unit is ready to measure.*

**Rest your target muscle (arm).**

*The channel “A” bargraph should read 5 or under. (2 or 3 is not uncommon)*

*When in measurement mode use the numbers in the center of the two bargraphs.*

*The scale reads from 1 to 800 microvolts.*

**Contract your muscle.**

*The reading on the bargraph should deflect*

*The continuous mode could be used to check a patients’ **Resting Baseline** by instructing the patient to relax and reading the bargraph.*

## **SETTING A GOAL**

**Press the “A” key.**

*Red light will flash next to **None**.*

**Press the “A” key several times.**

*Notice that the light will select (cycle through) all of the goals; **None, Above, Below, Above Stim, Below Stim, Max, A/B**.*

**IMPORTANT: WHEN YOU PRESS THE “A” KEY YOU ARE SETTING A GOAL; WHEN IN THIS MODE YOU WILL READ THE WORDS TO THE LEFT OF THE BLINKING RED LIGHT.**

**Press the “A” key until the **Above** goal is selected. (Not Above Stim)**

*The unit will automatically select the **Above** goal in about 3 seconds.*

**IMPORTANT: THE UNIT WILL NOW DEFAULT BACK TO MEASUREMENT MODE AND YOU WILL NOW READ THE NUMBERS IN THE CENTER OF THE BARGRAPHS.**

*Notice the orange light at “10”; This is your “Goal Level” or “Threshold”*

*You may adjust the goal up or down by **pressing the Up or Down Arrow keys**.*

**Flex your muscle so that the bar graph deflects above the orange light; notice that the unit will beep because the goal was successfully achieved.**

**Press the “A” key until the “Below” goal is selected. (twice)**

*The unit will now default to “**Measurement Mode**” and will work the same as the “Above” example, but the beep will be heard when the lights are below the threshold. (This could be a success tone for training someone to relax for example)*

**Press the “A” key until “None” is selected.**

*Goals will be shut off.*

## **WORK/REST MODE**

**Press the “A” key and the “B” keys at the same time for approximately 4 seconds.**

*Watch the lights in the lower part of the front panel.*

**Setup** will flash.

*After about 3 seconds Continuous will flash.*

**Press the “A” key.**

**Work/Rest** will flash.

*After 3 seconds you are prompted to change the “Work Time 10”*

**Select the desired work time by pressing the up or down arrow keys.**

*After 3 seconds you are prompted to change the “Rest Time 10”*

**Select the desired rest time by pressing the up or down arrow keys.**

*After 3 seconds you are prompted to change the “# Trials” 10.*

**Select the desired # of trials by pressing the up or down arrow keys.**

*After 3 seconds Unlocked will flash.*

*Unit will default back to **Measurement Mode** and immediately start a session prompting patient to work for (the set amount of seconds) and rest for (the set amount of seconds).*

***You may have to try this a few times until you learn the equipment. If you have to start over simply wait for the machine to enter measurement mode and start over.***

*When the session is complete “END” will be displayed.*

*Turn the unit off and then turn the unit back on, note the session number has incremented by 1.*

## **RUNNING SESSIONS**

### **CONTINUOUS MODE SESSION**

Turn unit off.

Turn unit on.

Note session #.

Put unit into continuous mode. (unit will power-up in continuous mode if unlocked)

Run unit for at least 1 minute.

Turn unit off to save session.

### **WORK / REST SESSION**

Record session #

Set goal if desired.. (if training session, no goal necessary for evaluation session)

Set work/rest time.

Session automatically begins and prompts patient to work and rest.

At end of session “END” is displayed.

Shut off unit to save session.

**Note:** Always set goal FIRST, then set Work/ Rest Mode.



## VIEWING A SESSION

**Press the “A” and the “B” keys at the same time or approx. 4 seconds.**

*Setup will flash.*

**Press the “A” key.**

*Review will flash.*

*Session# will be displayed.*

*Time of session will be displayed.*

*Average EMG will be displayed.*

*Goal will be displayed.*

## SAVING / CLEARING ALL SESSIONS

*SA will flash (SA stands for save)*

**Press no keys to save all sessions or Press the “A” key to change display to CL (this will clear all sessions)**

## DOWNLOADING TO SYNERGY PLUS FOR WINDOWS (For Synergy Plus for Windows owners only)

**Assure serial cable is connected to the MR25 and to the serial port of computer.**

**Open “Synergy Plus for Windows” by double-clicking the icon.**

**Select “Download” from the menu at the top of the screen.**

**Select “Download Data”.**

**Type a file name.**

**Click “OK”.**

**Turn on MR25.**

**Click “OK”**

## VIEWING DOWNLOADED DATA

**Select “Download”.**

**Select “View Downloaded file”.**

**Select file from list by clicking on the name of the file.**

**Click “OK”.**

**Print file by clicking the printer icon in the upper left corner of computer screen.**

# CABLE CONNECTIONS

- Use illustrations to **connect cables**, electrodes and accessories.  
Choose from the following configurations:
  1. Orthopedic
  2. Continence: Internal Sensor
  3. Continence: External Pelvic Floor Monitoring

Illustrations also helpful for **part identification** and **re-order numbers**.

# Using the MR-25 with a Computer

## Connecting MR-25 to the computer

**This step must be performed for Real-Time or Downloading.**

Connect the MR-25 to the computer using the **Serial Cable** provided.

Plug the cable into the port on the MR-25 labeled “Serial” first, then plug the other end into back of computer. Usually there is only one port that it will plug into-look for pins on the back of your computer not holes. If you have more than one serial port on your computer choose any one.

These instructions for Utilities / Compliance Software (Included with every MR25)

This software performs two functions (1) Real -Time display on screen and (2) Download sessions from MR-25 to be stored in a computer file.

## Installing Software

### Utilities/Compliance Software

#### **Software Installation:**

#### **For Windows 95 or 98:**

##### **Insert disk.**

Close all programs.

At “Desktop” click **Start**; select **Run**.

Type **A:Pathway**; click **OK**.

#### **For DOS:**

Insert disk.

At **A:** type **Pathway**, Press **Enter**

#### **For Both Windows and DOS:**

Click **OK** (or press **Enter**).

Click **Utilities** (or press **ALT U**).

Select **Install to Another Drive**.

Type **A**; Press the **Tab** key; Type **C**.

Press **Tab** to get to Install, Press **Enter**.

When prompted, Press **Enter**.

Press **F10** to exit program.

Remove disk.

## To Run Program:

#### **Windows 95 or 98:**

Click **Start**, Click **Run**.

Type **C:Pathway**, Click **OK**.

A paragraph will appear; Click **OK** or press **Enter**.

#### **DOS:**

Type **Pathway** at **C** Prompt, Press **Enter**.

A paragraph will appear; Click **OK** or press **Enter**.

## Set-Up Software

### (Step 1) Select Proper Model:

Select **Setup** by clicking (or by pressing ALT+S)

Select **Pathway Model** by clicking (or by using the **down arrow** then pressing **Enter**)

Select **MR-25**.

Click **OK** or press **Enter**.

### (Step 2) Select Proper serial port:

Select **Setup** by clicking (or ALT+S)

Select **Pathway Port** by clicking (or by pressing the **down arrow** key and then pressing **Enter**)

Select **Com Port 1** by clicking ( or using the arrow keys) **Note: the com port should read "Available"**.

Click **OK** or press **Enter**.

## Using Real -Time Mode (Running a Session)

Click **Real-Time/Download Data** (or press ALT+R)

Click **Real time display** (or use arrow keys and then press Enter)

Click **Continuous** (or use arrow keys); then click **OK** (or press Enter)

Click **30 Second** under **Sweep Length** heading (or use arrow keys); then click **OK** (or press Enter)

Real time display (plot) appears.

Read instructions at top of screen that explain command keys.

Turn on the MR-25 and set Goals/Timing if desired./Start session on the MR-25).

Press space bar to start the trace. (Start MR-25 session and computer session at the same time).

A red and green trace (line) should begin to move across the screen.

The session has now begun and the traces will respond to muscle contractions.

Important! If you do not get a trace go back to **Set-up Software** section; **Select the proper serial port and try com 2, com3, or com 4.**

When finished, turn off the MR-25; this saves the session.

**Note: The summary data is stored in the MR-25 unit, not the computer. There are two ways to retrieve the data: Download the data to a computer or view the data in the MR-25 itself.**

Press **Escape** on the computer keyboard.

The following functions are now available:

PRINTING - Press **P** to print (only what appears on screen)

SAVING DATA TO A FILE – (for advanced users only) Press **S** This will save the "Raw" data that could be sent to a spreadsheet for creating a graph.

EXIT TO MAIN MENU - Press **Escape** to get back to the Main Menu

## Exiting the Program

From the Main Menu press **F10** or Select **File** then **Exit**

*Downloading Sessions from the MR-25*

**Start Program** (if not already open)

### Windows 95 or 98:

Click **Start**, Click **Run**.

Type **C:\Pathway**, Click **OK**.

A paragraph will appear; Click **OK** or press **Enter**.

### DOS:

Type **Pathway** at **C** Prompt, Press **Enter**.

A paragraph will appear; Click **OK** or press **Enter**.

Select **Real-Time / Download** by clicking (or ALT+R)

Select **Download data to file** by clicking (or using the **down arrow** then pressing **Enter**).

Type a name for your file.

Click **OK** (or press **Enter**).

A message will appear "**Be sure the pathway is turned on and press [Enter] on the keyboard**".

Turn on the MR-25.

Click "**OK**" or press **Enter**.

**Beginning Download** message will appear.

Session data will be displayed on computer screen.

**Session #**, **AVE**(average micro-volt level), **Goal**, (type and goal value), **Success**( % of time that goal was achieved)

**Press any key to continue** will be displayed at bottom of screen.

Press any key when ready.

**Download Complete** will appear.

Click **OK** or press **Enter**.

**Note: If file download does not occur go back to" Set-up Software section;" Select Proper Serial Port" and try com 2, com3, or com 4.**

## **VIEWING DOWNLOADED DATA**

Click **File** or (ALT + F)

Click **View downloaded File** (or use **down arrow** then press **Enter**.)

Select file from list by **clicking** the name of the file or by using **arrow keys**.

Click **OK** or press **Enter**.

## **Print a downloaded File**

Click **File** or (ALT + F)

Click **Print a Downloaded file** (or use **down arrow** then press **Enter**.)

Select file from list by **clicking** the name of the file or by using **arrow keys**.

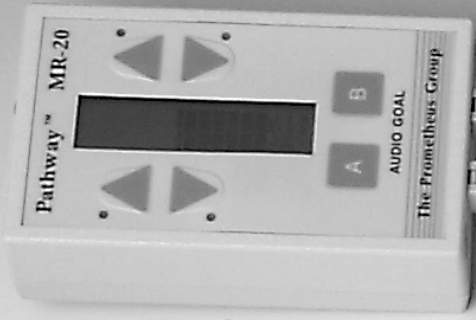
Click **OK** or press **Enter**.

### *Exiting the Program*

From the Main Menu press **F10** or Select **File** then **Exit**

Cable Connection  
Orthopedic

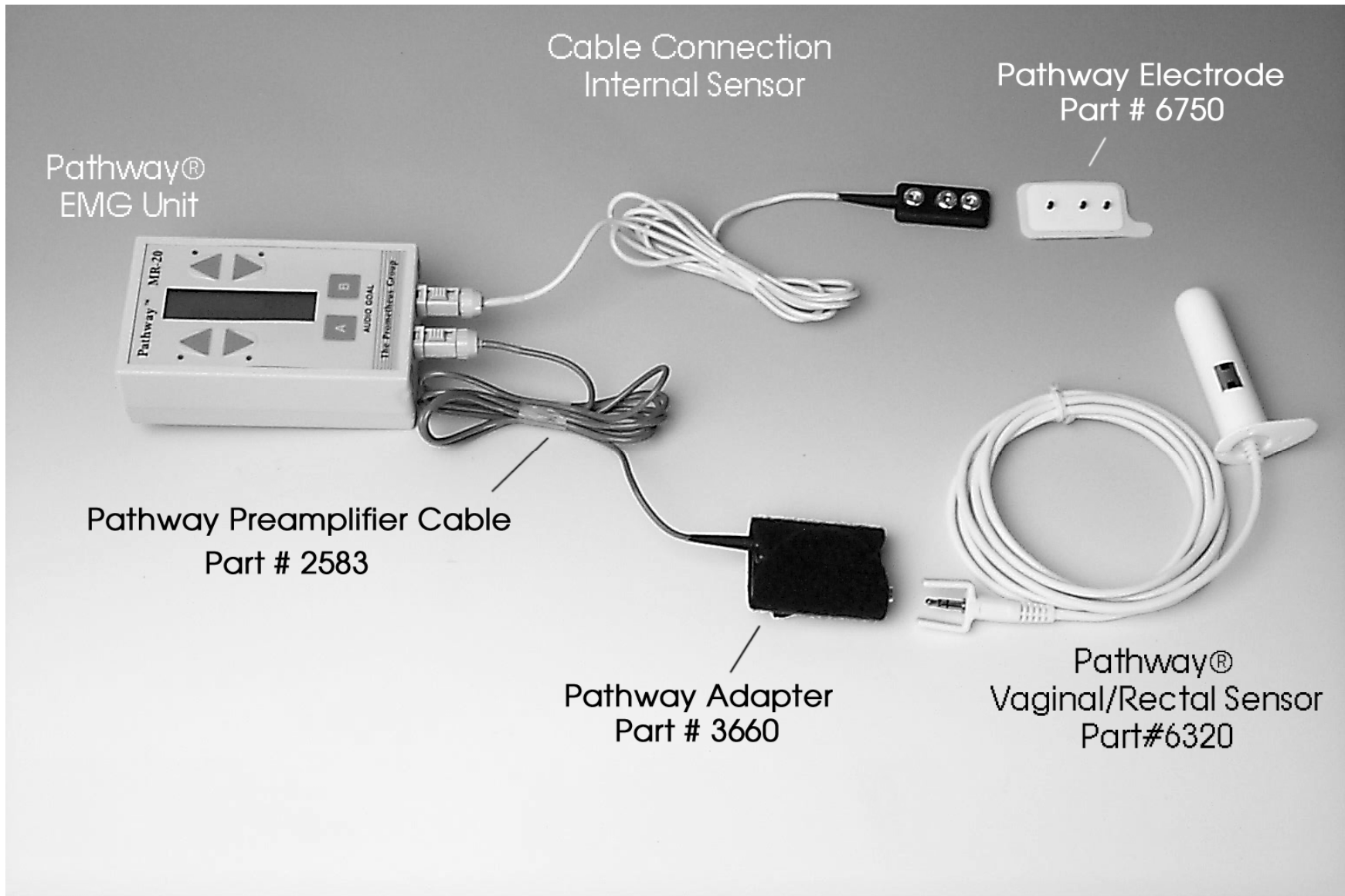
Pathway®  
EMG Unit



Pathway Electrode  
Part # 6750

Pathway Electrode  
Part # 6750

Pathway Preamplifier Cable  
Part # 2583



Pathway®  
EMG Unit

Cable Connection  
Internal Sensor

Pathway Electrode  
Part # 6750

Pathway Preamplifier Cable  
Part # 2583

Pathway Adapter  
Part # 3660

Pathway®  
Vaginal/Rectal Sensor  
Part # 6320

Cable Connection  
External Pelvic Floor Monitoring

Pathway®  
EMG Unit

Pathway Electrode  
Part # 6750

Pathway Preamplifier Cable  
Part # 2583

Pathway Adapter  
Part # 3660

18" Lead Wire Set  
Part # 5328

Pregelged Electrodes  
Part #6801



PATHWAY MR-25  
DUAL CHANNEL  
SURFACE EMG  
SYSTEM  
OPERATOR'S GUIDE

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## **CONTENTS**

The Pathway MR-25 kit contains the following items:

- The Pathway MR-25 module
- Two preamplifiers for EMG A & EMG B
- One PC computer 9 pin serial cable
- One Pathway Utilities software program disk Disposable adhesive electrodes
- One 9 volt alkaline battery
- One carrying case, and this
- Operator's guide

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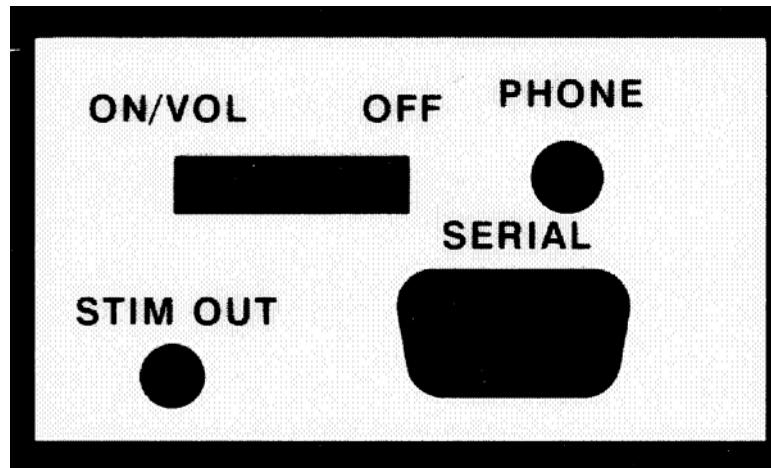
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## PHYSICAL

### The Top Panel:

- An ON/VOL OFF rotary thumbwheel which turns the Pathway MR-25 on and off and controls audio volume
- A mini PHONE jack to use an optional headset
- A STIM OUT jack to plug in a functional stimulator, and
- A SERIAL output for PC computer interface



### The Bottom Panel:

- Two inputs to plug in the preamplifiers

### The Back Panel:

- A clip for attaching the MR-25 to a belt or clothing, and
- The 9 volt battery compartment. The serial number label is inside the compartment.

### The Front Panel:

- Two LED bar graphs to display channel options, moving bar graphics, goal level, goal direction, and microvolt levels
- Three LED digits to display the actual values of EMG, goals, timing, and other functions
- Eight LEDs to indicate the current display mode
- Two up and down arrow keys to change the goals and other values for each channel, and
- An A and B key to define EMG A and B goal type, direction and control special functions

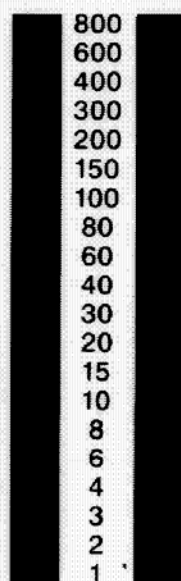
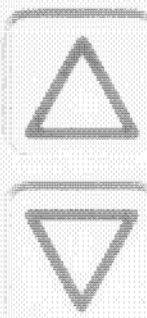
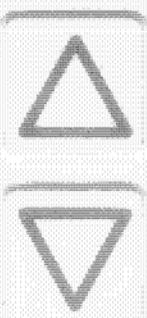
# The Prometheus Group

Pathway™  
MR-25

A  
B

BATT  
WORK  
REST  
STIM

SESSION  
# TRIALS  
% SUCCESS  
TIME



GOAL: NONE  
ABOVE  
BELOW  
MAX  
A/B  
CONTIN  
WORK/REST  
UNLOCKED  
LOCKED

NONE  
ABOVE  
BELOW  
MAX  
CHAN B OFF  
REVIEW  
SETUP

A

B

## **MECHANICAL**

### **Installing or Changing the Battery**

On the back panel is a 9 volt battery compartment. To install or change the battery simply press down on the designated area and slide the cover in the direction indicated. Clip on the new battery, place the battery in the compartment and replace the cover, snapping firmly into place. Either a disposable or rechargeable battery may be used. If using a disposable, an alkaline battery is recommended for longer life. A fresh alkaline battery will have 15-20 hours of useful life.

### **Attaching the Preamplifiers**

Plug in one preamplifier for EMG A into the input below the A key, and the other preamplifier for EMG B into the input below the B key. Snap on a disposable electrode to EMG A and EMG B. Each preamplifier has 3 snaps; 2 labeled ACT for Active and 1 GND for Ground. The disposable electrode must be completely snapped into all 3.

Prepare the skin by wiping the area with an alcohol pad and then wiping it dry with a tissue or cloth, to avoid high impedance artifact. Remove the backing on the disposable electrode to expose the adhesive surface and adhere fully to the skin. The two active electrodes must be placed parallel to the muscle fiber.

Optional preamplifier adapters are available for applications where lead wires or interface to incontinence sensors are required.

### **Using a Headset**

On the top panel is an output labeled PHONE. This output will accept any headset with a mono mini plug and will allow the audio feedback to be heard only by the person wearing the headset.

### **Plugging in a Functional Stimulator**

On the top panel is an output labeled STIM OUT. This output will accept any functional stimulator that has an accessory or manual input jack for activating stimulation. An interface cable between the Pathway MR-25 and the stimulator is available from The Prometheus Group.



## **Interfacing to a PC Computer**

On the top panel is an output labeled SERIAL. This output will interface to the serial port of any IBM PC compatible computer using the 9 pin serial cable. The male end of the cable is connected to the Pathway MR-25 and the female end to the computer. If the serial port requires a 25 pin connector, an adapter may be purchased from The Prometheus Group or at any local computer store. In conjunction with the Pathway Utilities software program disk, the PC computer may now be used to display real-time, full color EMG activity as well as download, store, and print patient data.

## **OPERATION**

### **Front Panel Indicators**

The digital display is used to display many different functions. The following indicators show what is being displayed.

To the right of the digital display are two indicators labeled A and B. These are used to indicate whether the value on the display relates to EMG A or EMG B. The BATT indicator is used to indicate that the battery voltage is on the display. It is also used as a warning indicator during operation when the battery is becoming too weak.

The WORK indicator is used to indicate that the current trial work time (in seconds) is on the display. It is also used during operation to indicate the beginning of a work period.

The REST indicator is used to indicate that the current trial or stim rest time (in seconds) is on the display. It is also used during operation to indicate the beginning of a rest interval.

The STIM indicator is used to indicate that the STIM ON TIME is displayed. It is also used during operation to indicate either that a stim goal is selected or that the stimulator output has been activated.

The SESSION indicator is used to indicate that the current session number is being displayed.

The # TRIALS indicator is used to indicate that the current trial number is being displayed.

The % SUCCESS indicator is used to indicate that the percent success of a trial is being displayed.

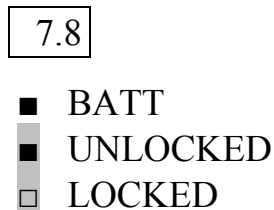
The TIME indicator is used to indicate that a time period is being displayed. Work, rest, and stim time are always displayed in seconds, while overall trial time is displayed in minutes.

The bar graph displays are used to show the current levels of EMG A and EMG B, based on the scale from 1 to 800 microvolts. When a goal is set for either channel the goal value is also shown on the bar graph.

The lower section of the bar graphs are also used to display goal type selections and the special function selections. These will be explained in the individual sections to follow. Selections made on the bar graph are shown in the following manner. The current selection is shown by a flashing red LED. The alternative selections are shown by non-flashing green LEDs. As will be described, these alternative choices can be made by pressing either the A or the B key.

## Start-up Display

The thumbwheel switch turns the MR-25 on and adjusts the volume. This will sound a tone which can be used to adjust the volume level, and display the current battery voltage along with the BATT indicator. At the same time the locked/unlocked state is indicated by the two indicators at the bottom of the bar graph display. If the MR-25 is unlocked the unlocked indicator will be flashing red and the locked indicator will be a constant green.



If the battery voltage is less than 7.5 volts the BATT indicator will be flashing. While the MR-25 will still operate correctly for a while, the battery should be replaced before much additional use. If the battery voltage is less than 7.0 volts, the battery is too low to use at all and the digital display will also be flashing. If the battery is not replaced at this time the MR-25 may stop operating during a training session. If the battery becomes this weak during operation, a tone will be generated and the BATT indicator will begin flashing.

Note that the internal memory of the MR-25 does not require the battery. Even if the battery is completely discharged or removed, the saved training session data will be preserved, as will all LOCKED mode parameters.

IF THE MR-25 IS TURNED ON AND IT DOES NOT WORK PROPERLY, FIRST TRY REPLACING THE BATTERY WITH A NEW ONE.

The MR-25 has two basic operating modes: UNLOCKED and LOCKED. In the UNLOCKED mode the type of goal, goal direction and goal position can be changed by the user.

If the Pathway MR-25 is to be used in an unsupervised environment such as the home, it can be LOCKED so that none of these parameters may be changed. Thus the patient must perform the preset training protocol. In this case the MR-25 would flash the LOCKED indicator during start-up instead of flashing the UNLOCKED indicator. Locking and unlocking the MR-25 is explained in the Special Functions section.

After displaying the battery voltage and locked/unlocked state for a few seconds the tone will stop and the SESSION indicator will light. The digital display will show the number of the current training session. For example if the display shows session 7 it means that there are already 6 previous sessions saved in memory and session 7 is beginning:

7

■ SESSION

Use the Saved Session Summary sheet in the back of this guide to record which patients are saved under each session number.

## **Running Training Sessions**

The Pathway MR-25 can run in two different training session modes, either the CONTINUOUS mode, or the WORK/REST mode. In the CONTINUOUS mode the Pathway MR-25 will run a single session for up to one hour, with no interruptions. In the WORK /REST mode the Pathway MR-25 will automatically prompt and control a predetermined number of alternate work periods and rest intervals.

## Continuous Mode

In the CONTINUOUS mode, which is the normal unlocked startup mode, the Pathway MR-25 will begin displaying EMG activity with no interruptions. A CONTINUOUS mode training session is defined very simply: WHEN THE MR-25 IS TURNED ON AND EMG ACTIVITY IS DISPLAYED FOR AT LEAST ONE MINUTE, A NEW TRAINING SESSION IS SAVED IN MEMORY. A readily distinguished beep will occur at the end of one minute to indicate this. When the MR-25 is turned off and back on, the next session will automatically begin.

The maximum length of each CONTINUOUS mode training session is 60 minutes. At the end of this time the MR-25 will beep and the SESSION indicator will be illuminated. The digital display will show the message:

End

■ SESSION

Turn the MR-25 off to save the session in memory when this occurs.

## The Work/Rest Mode

In the WORK/REST mode the Pathway MR-25 will begin the session by first illuminating the WORK indicator and the # TRIALS indicator and displaying the current trial number in the digital display.

1

■ WORK  
■ # TRIALS

The MR-25 will make three short beeps and then begin displaying EMG activity. As a reminder the WORK indicator will remain on during the work period. At the end of the set work period, the Pathway MR-25 will light the REST indicator, the # TRIALS indicator and again display the trial number in the digital display.

1

■ REST  
■ # TRIALS

The MR-25 will then make one long beep, and then return to an active EMG display with the REST indicator remaining on. During this rest interval the EMG activity is being displayed so that the resting levels may be observed. However, audio feedback is not active. The readings during this time are not included in the session data in any way.

The session average, the maximum values, and the percent success are not affected by anything which occurs during a rest interval. At the end of the rest interval the next work period will automatically begin.

The WORK/REST mode has three parameters which can be set to customize the session for each application. The work period of each trial can be set between 3 and 180 seconds. The rest interval between trials can be set between 0 and 180 seconds. The number of trials in the WORK/REST session can be set between 1 and 20.

A WORK/REST mode training session is defined very simply: WHEN THE MR-25 IS TURNED ON AND THE FIRST WORK PERIOD IS COMPLETED, A NEW TRAINING SESSION IS SAVED IN MEMORY. This is true even though the full set number of trials were not completed. For example, if the session were set up to have 10 trials, but the MR-25 was turned off after the end of the seventh work period, the saved session would include the data obtained for the 7 completed trials. When the MR-25 is turned off and back on, the next session will automatically begin.

If the set number of trials is completed, the MR-25 will make a long beep, light the SESSION indicator and show End in the digital display.

End

■ SESSION

Turn the MR-25 off when this message appears.

## The Training Displays

A few seconds after being turned on, the Pathway MR-25 will automatically display EMG activity. The current level of EMG activity is shown by the illuminated LEDs on the bar graph. The values are shown on the scale between the two bars. Although only 20 LEDs are used the MR-25 uses 2 levels of brightness and lights pairs of LEDs to show 4 times as many levels. For example the following sequence is used between 2 LEDs:

	STEP 1	STEP 2	STEP 3	STEP 4
LED 3:	OFF	HALF ON	FULL ON	FULL ON
LED 2:	FULL ON	FULL ON	FULL ON	HALF ON

The next step after step 4 is the same as step 1 but is 1 LED position up the display. Note that this sequence is an analog representation which gives an excellent feeling of the values in between the LEDs. When this display is combined with the normal EMG value changes, it shows the EMG levels just as if there were 80 LEDs in each bar!

During a training session the left bar shows the EMG A channel and the right shows the EMG B channel. Note that increasing muscle activity moves the bar up and decreasing activity moves the bar down. In addition there is a digital (numeric) display which also shows the EMG value in microvolts.

To observe the operation of the display, connect the EMG preamplifiers to the MR-25 and apply the electrodes to a convenient area such as the forearms, as described in the section "Attaching the Preamplifiers". Note how the moving bar display ascends and descends, as the hand and wrist muscles are contracted and relaxed.

Because EMG is essentially a logarithmic function, this type of scaling is used for the moving bar display. As a result, the movement of the bar relates directly to the change in muscle activity.

The changing digital numbers represent microvolt (uV) levels of EMG activity and increase when contracting and decrease when relaxing.

The total microvolt scale is 1 to 800 uV RMS. The digital display is shared between the two channels. Pressing the A key sets the digital display to the EMG A channel and pressing the B key sets it to the EMG B channel. The current setting is indicated by the A and B indicators to the right of the digital display.

## Setting the Feedback Mode

The A key is used to set the feedback mode for EMG A and the B key for EMG B. Since the EMG A is the controlling channel, set up the mode for EMG A first, then EMG B. By pressing the A key once, the current mode will be momentarily displayed on the EMG A channel.

In this case the display will indicate GOAL: NONE. This will be indicated by the GOAL: NONE indicator flashing red and the other A goal indicators constant green.

- GOAL: NONE
- ABOVE
- BELOW
- MAX
- A/B

To change the mode simply press the **A** key again until the desired mode is displayed flashing red. When no keys are pressed for a few seconds, the MR-25 will return to the real-time EMG display.

## Feedback Modes

Feedback mode choices are:

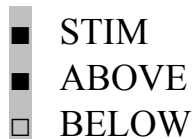
- 1) NONE -- no goal or feedback.
- 2) ABOVE TONE -- audio feedback when contracting above goal.
- 3) BELOW TONE -- audio feedback when inhibiting below goal.
- 4) ABOVE STIM -- stimulator activation when contracting above goal.
- 5) BELOW STIM -- stimulator activation when inhibiting below goal.
- 6) MAX -- the maximum value measured is displayed on the bar and in the digital display until reset by a keypress.
- 7) A/B -- the ratio of EMG A divided by EMG B is displayed.

The **B** key has the first six choices plus one additional: CHAN B OFF. Select this mode if only EMG A is to be utilized (single channel mode). NOTE: The EMG A channel is the controlling channel for feedback modes. If a STIM feedback mode is selected for the EMG A channel, the EMG B channel cannot be in a TONE mode. Similarly, if a TONE mode is selected for the EMG A channel, the EMG B channel cannot be in a STIM mode. Therefore always set the A channel to the desired mode first.

Note that the TONE ABOVE and TONE BELOW modes are indicated by the ABOVE and BELOW indicators.



The STIM ABOVE and STIM BELOW modes are indicated by the combination of the STIM indicator and the ABOVE or BELOW indicators.

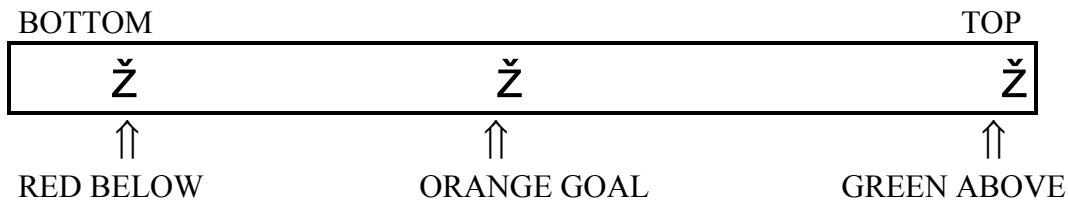


## Above and Below Goals

When ABOVE or BELOW goal choices are made, one LED on the bar will be illuminated in orange. The position of the goal LED in the display represents an absolute microvolt goal.

When an ABOVE or BELOW goal is selected, the EMG bar indicators change color to indicate goal success. The EMG bar is displayed in green when it is above an ABOVE goal or below a BELOW goal (success). The bar is displayed in red when the EMG level is not successful, below an ABOVE goal or above a BELOW goal.

For an ABOVE goal:



If a TONE goal is selected for a single channel and the EMG activity meets or exceeds the goal, a pulsed tone will be heard. If TONE goals are selected for BOTH channels and the EMG activity meets or exceeds the goals for BOTH channels simultaneously, then a pulsed tone will be heard. By presenting audio feedback only when BOTH goal parameters are met, there is no confusion on the patient's or therapist's part as to what constitutes success.

Similarly, if a STIM goal is selected for a single channel and the EMG activity meets or exceeds the goal (for the SUCCESS TIME), the stimulator will be activated. If STIM goals are selected for BOTH channels and the EMG activity meets or exceeds the goals for BOTH channels simultaneously (for the SUCCESS TIME), then the stimulator will be activated.

## Changing the Goal Value

When a tone or stim goal is initially selected, the default goal value is 10 microvolts. To change the goal value, the up and down arrow keys for each channel are used. The A channel arrow keys change the EMG A goal, and the B channel arrow keys change the EMG B goal.

If any of the 4 arrow keys are pressed, the digital display shows the current goal setting rather than the current level of EMG. Note that the bar itself still shows the current level of EMG activity, so that goals can be changed without interrupting the training session.

To change the goal value, simply press the appropriate arrow key until the desired goal is reached. Use single key presses to increment or decrement the goal value, or hold the key down for larger changes. Both the digital display and the position of the goal arrow will change to reflect the current value. When the desired goal value is displayed, do not press any keys. The MR-25 will return to the real-time display in a few seconds.



Note that the digital display of the goal is flashing to distinguish it from the normal EMG display.

## **Max Display Mode**

In the MAX DISPLAY mode, the digital numbers on the display show the highest reading of the current session for that channel. Any time the value shown is exceeded, the new higher value will be displayed. At any time the value can be reset by pressing one of the arrow keys for that channel. In the WORK/REST mode the value is automatically reset at the beginning of each trial.

The bar display always shows the current level of EMG activity in addition to the most recent maximum. The maximum is shown by an illuminated LED at the previous maximum of the moving bar. When the digital display is reset (by pressing one of the arrow keys for that channel) the maximum indicator is also reset to the moving bar.

The MAX DISPLAY mode can be used for either or both channels, and either channel may be set to the MAX DISPLAY mode while the other channel is set to any of the other modes.

## **Ratio Display Mode**

The ratio display mode shows the value of EMG A divided by EMG B on both the bar and the digital display. This mode generates a very clear comparison of the activation of one muscle to another. It may be used in bilateral training, comparing a muscle on the left side to the same one on the right. It also may be used to train activation of one muscle while inhibiting an opposing or substituting muscle.

When the A key is pressed, the bar display shows the current goal type and the digital display shows the current value of the EMG A channel. When the B key is pressed, the bar display shows the current B goal type of NONE and the digital display shows the current value of the EMG B channel. This allows the user to see the individual EMG values while in the ratio mode. The display will return to the ratio display in a few seconds.

The ratio goal is an ABOVE TONE type of feedback, with a tone generated when the ratio goal is exceeded. The center of the bar is the 1:1 ratio position, the top of the bar is 10:1, and the bottom is 0.1:1.

When the ratio mode is initially selected, the default ratio goal value is 1 to 1. If either of the A arrow keys are pressed, the digital display shows the current ratio goal value rather than the current EMG ratio. To change the ratio goal value, simply continue to press the appropriate A arrow key until the desired ratio goal is reached.

Use single key presses to increment or decrement the ratio goal value, or hold the key down for larger changes. Both the digital display and the position of the goal arrow will change to reflect the current ratio goal value. When the desired ratio goal value is displayed, do not press any keys. The MR-25 will return to the real-time display in a few seconds.

In the ratio mode pressing either of the B arrow keys temporarily halts the operation of the MR-25, freezing the display. This allows the values at any point in time to be easily recorded. When the MR-25 is halted, pressing either of the B arrow keys causes operation to resume.

## **Special Functions Mode**

The special functions mode accesses all of the data functions and is used to review and download training session data. In addition this mode accesses the session timing modes and the stimulator setup allowing the stimulator timing to be changed. Also this mode allows the MR-25 to be locked in a special patient use mode. Pressing both the A and B keys simultaneously for a short time will access these special functions.

When this mode is accessed the REVIEW and SETUP indicators are illuminated with the SETUP indicator the active choice (flashing red). Pressing either the A or the B key once will change the active choice to REVIEW.

<input checked="" type="checkbox"/>	REVIEW
<input type="checkbox"/>	SETUP

## **Patient Data**

In either the LOCKED or UNLOCKED mode, the MR-25 can save the data of up to thirty-two training sessions in its memory storage area. This memory is non-volatile, meaning it will be preserved EVEN IF THE BATTERY IS DISCONNECTED. The battery can be replaced with no danger of losing the stored training sessions.

As discussed in the Running Training Sessions section, a training session is generated when the MR-25 is on and in the real-time EMG display for more than one minute when in the CONTINUOUS MODE, or after the first completed trial when in the WORK/REST mode. The training session begins when the MR-25 is turned on and ends when the MR-25 is turned off.

The data stored for each session consists of the training session number, the average microvolt level, the maximum microvolt level, the type of goal and its value, the percent goal success or the number of times the stimulator was activated. In the CONTINUOUS mode the number of minutes of use is stored, and in the WORK/REST mode the number of completed trials is stored.

## Reviewing Data

The data from all stored training sessions can be reviewed and downloaded. In order to review the current session the MR-25 must be turned off and back on in order to save the session. As described above, the special functions mode must be selected and the first choice of REVIEW or SETUP changed to REVIEW by pressing the A or the B key once. This selects the data review mode.

The first information presented in review is the most recent session number. The digital display will show the session number and the SESSION indicator will be illuminated.

5

■ SESSION

At any time during data review the up and down arrow keys can be used to select a different session to review. Pressing either down arrow would change the session being reviewed to session 4.

After the session number is displayed for a few seconds, the time or number of trials is displayed. If the session had been done in the continuous mode the display would show the length of the session in minutes.

12

■ TIME

If the session had been done in the work/rest mode the display would show the number of trials completed.

7

■ # TRIALS

After a few seconds the display will change to the average EMG level for the EMG A channel. The average level is shown in the digital display and the A indicator is illuminated.

32

■ A

To review the average EMG level for the B channel press the B key. The digital display shows the average level and the B indicator is illuminated.

24

■ B

Pressing the A key changes the display back to the EMG A channel. When no key is pressed for a few seconds the display changes to the goal type and success. The goal type is shown in the bar graph display and the success is shown in the digital display. For example if the session had been done with EMG A set to an ABOVE TONE type of goal, the display would show:

68

■ A  
■ % SUCCESS  
■ ABOVE

As above, the A key displays the information for the EMG A channel and the B key changes it to the EMG B channel. If the goal type were STIM the display would show the number of times the stimulator was activated and the STIM indicator would be illuminated.

8

- A
- STIM
- % SUCCESS
- ABOVE

When a ratio mode session is reviewed, pressing the A key shows the percent success of A/B. Pressing the B key only shows GOAL: NONE since there is no EMG B goal type. If no key is pressed for a few seconds the MR-25 will next illuminate the SESSION indicator and the digital display will show a flashing SA.

SA

- SESSION

If no key is pressed the MR-25 will continue to save all of the session data. If the A or B key is pressed the display will change to a flashing CL.

CL

- SESSION

In this case the MR-25 will clear out all of the saved session data. Be sure the desired data has been recorded before clearing the data. If the A or B key is pressed the display will change back to a flashing SA and the data will be saved. When no key is pressed for a short time the display will return to the real-time EMG display.

## Clearing Data

The MR-25 can store the data from 32 separate training sessions. The MR-25 will stop storing the data of training sessions when 32 training sessions have been stored. Therefore, it is important to regularly clear the memory storage area. Before doing this, make sure that the data from training sessions has been written down.

When the Pathway Utilities software is used to download the data to a PC computer, the MR-25 data is automatically cleared. If the data is not downloaded and thus cleared it must be cleared by selecting REVIEW as above and selecting CL for clear at the end of the review.

## Downloading Data

Although the essential data from patient sessions can be reviewed on the screen, a more complete report can be generated by downloading to a personal computer. The section WORKING WITH A PC COMPUTER contains complete instructions for downloading data.

## Setup Choices

To change the setup or configuration of the MR-25, access the special functions mode. When this mode is accessed the following choices appear:

- REVIEW
- SETUP

Since the SETUP choice is the default (flashing red) it is not necessary to press the A or B key to change the selection.

The sequence in the SETUP procedure depends on whether or not either channel has a STIM type of goal active. If neither channel is set to a STIM mode the display will change to the choice of CONTIN and WORK/REST with CONTIN the default (flashing red).

- CONTIN
- WORK/REST

If the CONTINUOUS mode is desired, pressing no key will keep that mode active. Pressing either the A or the B key will change the selection to the WORK/REST mode.

The WORK/REST mode, as described in the Running Training Sessions section is the mode which will include a set number of active work periods, separated by rest intervals. If the WORK/REST mode is selected the next display will show the work time in seconds.

10

- WORK
- TIME

The digital display will be flashing the current work period. Use the up and down arrow keys to increase or decrease the new work period. The work period may be set from 3 to 180 seconds. When no key is pressed for a few seconds the next display will appear:

10

■ REST  
■ TIME

The digital display will be flashing the current rest interval. Use the up and down arrow keys to increase or decrease the new rest interval. The rest interval may be set from 0 to 180 seconds. When no key is pressed for a few seconds the next display will appear:

10

■ # TRIALS

The digital display will be flashing the current number of trials. Use the up and down arrow keys to increase or decrease the new number of trials. The number of trials may be set from 1 to 20 trials.

The MR-25 has a default WORK PERIOD of 10 seconds, a default REST INTERVAL of 10 seconds, and a default NUMBER OF TRIALS of 10. These are the initial values when in the UNLOCKED mode.

Note that since the CONTINUOUS mode does not have any timing to select, the above displays only appear if the WORK/REST mode is selected. Also since the timing is controlled differently if a stimulator is active, the WORK/REST choice is not available if one of the EMG channels is in a STIM mode.

After the above selections are made and no key is pressed for a few seconds the last choice is presented on the display. This is the choice to UNLOCK or LOCK the MR-25. Refer to the Lock Mode section for the details.

## Stim Timing

If one of the EMG channels is set to a STIM goal the above sequence is different. After SETUP is selected the first choice is the STIM ON TIME. The display will show:

30

■ STIM  
■ TIME

The STIM ON TIME is the number of seconds the stimulator will be activated when the GOAL SUCCESS criteria is met. Use the up and down arrow keys to increase or decrease the new STIM ON TIME. The STIM ON TIME may be set from 1 to 180 seconds. After the above selection is made and no key is pressed for a few seconds the last choice is presented on the display. This is the choice to UNLOCK or LOCK the MR-25. Refer to the Lock Mode section for the details.

The GOAL SUCCESS TIME is the number of seconds of continuous goal success necessary to activate the stimulator. This time prevents the stimulator from being activated unless success is clearly achieved. The MR-25 has a fixed GOAL SUCCESS time of 5 seconds.

The MR-25 has a default STIM ON TIME of 30 seconds. This is the initial value when in the UNLOCKED mode.

## Working with a Functional Stimulator

To use the MR-25 to control a stimulator, the stimulator must be configured properly and the MR-25 must be connected via the stim interface cable. Basically the stimulator is set to be controlled by a switch connected to its accessory input jack. The MR-25 STIM OUT jack provides the switch connection.

For the MR-25 to be able to control the stimulator, there are settings on the stimulator itself which must be correct. The stimulator must be configured with the ON TIME set for the maximum, the OFF TIME set for the minimum, and set to CONTINUOUS stimulation.

Once it is verified the stimulator is working correctly, plug one end of the stim interface cable into the stimulator accessory jack and the other end into the STIM OUT jack of the MR-25. The stimulator should now be controlled by the MR-25 in the stim feedback mode.



If the stimulator is ON when it should be OFF, change the polarity of the stim relay in the MR-25 Special Functions mode. (Refer to the Stim Relay section below.) If the stimulator is not working correctly contact the dealer or manufacturer of the stimulator.

The stimulator cycle is composed of three time periods.

First there is a GOAL SUCCESS time, which is set to 5 seconds. The level of EMG activity must meet the goal continuously for the GOAL SUCCESS time before the stimulator is activated. This prevents the stimulator from being activated prematurely.

When the goal is met, the MR-25 will activate the stimulator for a set time period, the STIM ON TIME. At the end of this time the stimulator will be turned off. This time is can be set between 1 and 180 seconds. When the stimulator is activated, pressing any key on the MR-25 will immediately stop the stimulation.

Following the activation of the stimulator, there is a REST TIME of 10 seconds, to allow patient recovery before the active display begins.

## **Lock Mode**

When the MR-25 is LOCKED, none of the goal types or microvolt goal levels can be changed. To set this mode, go into the special functions mode and select SETUP. After the above timing choices, the last choice is UNLOCKED and LOCKED. At this time pressing the A or B key toggles the selection between UNLOCKED and LOCKED.

- UNLOCKED
- LOCKED

When no key is pressed for a few seconds the choice which is flashing will take effect and the MR-25 will return to the real-time display.

In the locked mode the keys are not active and the patient cannot change the goal parameters established by the therapist. Notice that when locked the digital microvolt values are no longer displayed to simplify feedback to the patient. In addition the one minute session beep is not made. The MR-25 may be UNLOCKED as above by choosing SETUP and changing the choice to UNLOCKED.

## Stim Relay

The STIM RELAY setting determines whether the relay on the MR-25 is normally OPEN or normally CLOSED. Some models of stimulators require one setting and some require the other.

If the stimulator is activated immediately when the stim interface cable is plugged into the MR-25, the stim relay setting may need to be changed. The MR-25 is shipped with the relay CLOSED which works with the majority of stimulators. Therefore, to change the relay setting press and hold down the |B| key while turning the MR-25 on. The STIM indicator will be illuminated and the digital display will show the current setting, either OPEN or CLOSED. At this time pressing the A or B key toggles the selection between OPEN and CLOSED.

The display will show:

OP

■ STIM

or

CL

■ STIM

Changing the setting to OPEN will allow the MR-25 and the functional stimulator to work properly together if the CLOSED setting did not work correctly. The relay may be CLOSED in a similar manner.

## Stimulator Activation

If STIM is selected as the goal type and the goal or goals have been met continuously for the 5 second GOAL SUCCESS time, the stimulator will be activated. The MR-25 will illuminate the STIM and TIME indicators and show the STIM ON TIME in the digital display.

30

■ STIM  
■ TIME

The number of seconds of stimulation left is displayed and will count down until reaching zero at which time the stimulation will stop. The duration of the stimulation is determined by the STIM ON TIME. The stimulation may also be stopped at any time during the count down by pressing any key.

A patient rest interval is provided after stimulation is completed. The MR-25 will illuminate the REST and TIME indicators and show the REST TIME in the digital display.

10

■ REST  
■ TIME

This display will count down the rest interval and then automatically return to real-time EMG activity, ready to activate the stimulator again when the goal is met.

## **Custom Settings Mode**

The MR-25 has a special start-up mode called the Custom Settings mode. Normally, when the MR-25 is turned on (in the unlocked mode) the goal and timing settings have standard default values. The Custom Settings mode makes all of the settings have the same values that had been set the last time the MR-25 was turned off.

For example, if the goals, goal values, and timing were set for a particular exercise, and the user wanted to start an identical new session, this would easily be done.

Simply turn the MR-25 off, ending the present session. Then turn the MR-25 on while holding down the A key. All of the goal and timing values will remain, just as if the MR-25 were in the LOCKED MODE. Note that this must be done each time the unit is turned on to be active.

## **WORKING WITH A PC COMPUTER**

The Pathway Utilities software supplied with the MR-25 provides the capabilities of viewing real-time EMG activity (on an EGA or VGA display), and of downloading the data from the stored training sessions. The cable supplied must be connected to the serial port of the computer, and plugged into the serial connector of the MR-25.

The Pathway Utilities software may be run on the floppy diskette provided, or may be installed on a hard disk drive. To begin running the Pathway software, place the diskette in a drive, and make that drive the default drive by typing the drive letter followed by a colon ":" and pressing [ENTER].

For example, to make the "A" drive the default drive type: "A:" and press [ENTER]. Next, type the command "PATHWAY" and press [ENTER].

The Pathway software has a simple menu-driven interface. Selections can be made using either the keyboard or a mouse. The prompt line at the bottom of the screen explains each choice.

After the Utilities software begins running, the title window will appear in the middle of the screen. Note that the bottom line of the screen shows a help prompt to press the [ENTER] key to continue. There is also an "OK" box in the center of the screen. Either press the [ENTER] key, or point and click on the OK box with a mouse.

Now the screen shows the main menu. Across the top of the screen are the menu choices. Each menu choice has one letter highlighted in a different color. Pressing the [ALT] key along with the highlighted key opens the menu. (Pointing and clicking with the mouse does the same thing.) When the menu is opened, the cursor keys change the highlighted selection. Pressing [ENTER] selects the highlighted choice, as does pointing and clicking with a mouse. Pressing [ESCAPE] exits without making a choice.

### **Installation to Another Disk**

The Pathway Utilities software cannot be installed by just copying the files to another disk. To install the Pathway software to a hard drive, start running the Utilities software as described above, select the "Utilities" menu, and then choose "Install to another disk".

## **Configuring the Pathway Utilities Software**

The Pathway Utilities software must be set for the correct model of the Pathway, the correct serial port the MR-25 cable is connected to, and the correct printer type. A SERIAL PORT on the back of the computer is normally either a 9 pin or a 25 pin MALE connector (with pins showing, not holes). A PARALLEL PORT is a 25 pin FEMALE connector (with holes showing). The Pathway MR-25 WILL NOT WORK CONNECTED TO A PARALLEL PORT.

In the "Setup" menu choose "Pathway Setup". First select the correct model choice, the MR-25. Then use the [TAB] key to choose the serial port the cable is plugged into, either COM1 or COM2.

To set up the printer configuration, also in the "Setup" menu, choose "Type of Printer", and choose the printer type or its emulation mode. Most printers are designed to emulate one of the industry standard types listed. Refer to the instruction manual that came with the printer for this information.

After choosing the type of printer, also in the "Setup" menu, choose "Setup of Printer". Select LPT1 or LPT2 depending on which port the printer is connected to. On most systems this will be LPT1.

## **Serial Test**

There is a Serial Test choice in the Utility menu which is designed to easily make sure that the connections and the configuration are correct for either Viewing Real-time EMG or for Downloading Data. This test is the first thing to use to determine whether the Pathway is able to communicate with the PC computer. The instructions for its use appear on the screen.

## **Viewing Real-time EMG**

To view real-time EMG, select the "Real time / Download data" menu. Then choose "Real time display". After choosing the session length, press any key to begin the session. During the session the EMG activity of both channels from the MR-25 is plotted on the screen. At the end of the session time, press "P" to print an image of the screen on the printer, or press [ENTER] to do another session, or press [ESCAPE] to return to the main menu. The printer must be set up correctly before attempting to print a session plot.

## **Downloading Data**

To download data the 9 pin serial cable must be connected to the SERIAL output of the MR-25 and to the SERIAL input of the PC computer with the Pathway Utilities software running.

To download MR-25 session data, start running the Utilities software, select the "Real time / Download data" menu. Then choose "Download data to file". Then enter a file name to download the data into. (Be aware that re-using an existing name will replace the old data with the new.) Then the screen shows instructions to connect the MR-25 to the computer and then press [ENTER] on the computer. As long as the MR-25 is displaying EMG activity, and is connected to the computer, downloading is automatically done. It is not necessary to press any keys on the MR-25.

When the download is complete, a message appears either that the download was complete, or that there may have been an error. If there was an error, downloading should be repeated or else the data may not be correct.

The data is shown on the PC screen as it is downloaded.

If the download is completed successfully the MR-25 data memory will automatically be cleared. When the data has been successfully downloaded, the file will be in the "\PATHWAY\DATA" directory on the disk.

The MR-25 normally takes just a few seconds to complete downloading the stored data. If it does not seem to be progressing correctly it is recommended that the serial test be used to check the communication between the MR-25 and the computer. Also check all connections and make sure that the Utilities Software is configured correctly.

## **Viewing or Printing Data**

The previously downloaded data may easily be viewed on the PC computer screen or printed on a printer. In the File menu select "View a downloaded file". Use the cursor keys to highlight the desired file from the list which appears, and press [ENTER]. The selected file will appear on the screen. Use the [PAGE UP] and [PAGE DOWN] keys to move within the file, and the [ESCAPE] key to exit. To print a downloaded file select the "Print a downloaded file" menu choice. Again a list of files will appear. Choose the desired file and printing will begin.

## **Deleting Downloaded Data Files**

As noted before, if the same file name is reused, the old data file will be overwritten and will be lost. Thus, if new names are often used, eventually a large collection of files will exist in the downloaded data directory. The menu choice: "Delete a downloaded file" can be used to eliminate files which are no longer needed. Note that once such files are deleted the data is lost.

In the File menu select "Delete a downloaded file". Use the cursor keys to highlight the desired file from the list which appears, and press [ENTER]. After being asked to confirm deleting the file, it will be deleted. If you do not want to delete the file press the [ESCAPE] key instead of the [ENTER] key.

## **View Instruction Manual**

In the File menu the selection "View Instruction Manual" will display the instruction manual on the screen. Use the [PAGE UP] and [PAGE DOWN] keys to move within the manual, and the [ESCAPE] key to exit.

## **Pathway MR-25**

### **Technical Specifications**

- Two EMG Channels
  - Active Electrode Preamplifier
  - 1 - 800 Microvolt Range
  - One Logarithmic Display Range
  - Above/Below Goals
  - True RMS Conversion
  - Reading Rate: Every 100 Milliseconds
  - 20 to 500 Hz Bandpass
  - No Notch Filter
  - Input Common Mode Rejection greater than 110dB
  - Input Noise Level of <1 Microvolt
  - Active Electrode Impedance of 10 gigohms
  - Accuracy of 2% +/- 2 Microvolts (Less Than 500 Microvolts)
  - Isolated Computer Port
  - Belt/Pocket Clip
  - Dimensions: 4.6" x 2.7" x 1.5"
  - Weight: 8 Ounces
- Power: Standard 9 Volt Battery

### **Electrodes**

To re-order electrodes for any Pathway device please call your dealer or The Prometheus Group sales office at (800)-442-2325.

For surface EMG applications the compatible electrodes are order numbers (from The Prometheus Group) of 6750 for the DeLuca preamplifiers, 6581 for the microamp preamplifiers, and 6801 for individual lead wires.

For incontinence applications the compatible electrodes are the PerryVaginal Sensor, the Empi Vaginal Elec Sense/Stim, or the Hollister In/care perineometer.

### **Electromagnetic Compatibility and Interference**

The Pathway MR- 25 has been tested for Electromagnetic Compatability and Electromagnetic Interference and complies with the requirements set forth in EN 60601-1-2:1993, to include EN55011:1991 for radiated emissions, IEC 801-2:1991, and IEC 801-3:1991 (Draft).



## SAVED SESSION SUMMARY

Session/Patient Name	Type	By	Date	Time	Muscle Placement
1. _____	_____	_____	_____	_____	_____
2. _____	_____	_____	_____	_____	_____
3. _____	_____	_____	_____	_____	_____
4. _____	_____	_____	_____	_____	_____
5. _____	_____	_____	_____	_____	_____
6. _____	_____	_____	_____	_____	_____
7. _____	_____	_____	_____	_____	_____
8. _____	_____	_____	_____	_____	_____
9. _____	_____	_____	_____	_____	_____
10. _____	_____	_____	_____	_____	_____
11. _____	_____	_____	_____	_____	_____
12. _____	_____	_____	_____	_____	_____
13. _____	_____	_____	_____	_____	_____
14. _____	_____	_____	_____	_____	_____
15. _____	_____	_____	_____	_____	_____
16. _____	_____	_____	_____	_____	_____
17. _____	_____	_____	_____	_____	_____
18. _____	_____	_____	_____	_____	_____
19. _____	_____	_____	_____	_____	_____
20. _____	_____	_____	_____	_____	_____
21. _____	_____	_____	_____	_____	_____
22. _____	_____	_____	_____	_____	_____
23. _____	_____	_____	_____	_____	_____
24. _____	_____	_____	_____	_____	_____
25. _____	_____	_____	_____	_____	_____
26. _____	_____	_____	_____	_____	_____
27. _____	_____	_____	_____	_____	_____
28. _____	_____	_____	_____	_____	_____
29. _____	_____	_____	_____	_____	_____
30. _____	_____	_____	_____	_____	_____
31. _____	_____	_____	_____	_____	_____
32. _____	_____	_____	_____	_____	_____

# **PATHWAY STARTUP / INSTALLATION INSTRUCTIONS**

## **System Requirements for Pathway Utilities Software**

In order to view the real-time plots of EMG Activity, the IBM compatible computer system must have an EGA or VGA compatible graphic display. In order to print out a copy of the screen on the printer it must be compatible with one of the supported graphic printers. These include printers which emulate the Epson 9 pin and 24 pin printers, those which emulate the HP Laser Jet and Deskjet printers, and many others. Refer to the printer manual to determine its emulation or compatibility capabilities. The Utilities Software also requires a free (unused) serial port on the computer.

## **Startup Instructions**

The Pathway Utilities software may be run on the diskette provided, or may be installed on a hard disk drive. To begin running the Pathway software, place the diskette in a drive, and make that drive the default drive by typing the drive letter followed by a colon ":" and pressing [ENTER].

For example, to make the "A" drive the default drive type: "A:" and press [ENTER]. Next, type the command "PATHWAY" and press [ENTER].

The Pathway software has a simple menu-driven interface. Selections can be made using either the keyboard or a mouse. The prompt line at the bottom of the screen explains each choice.

## **Installation to Another Disk**

To install the Pathway Utilities software to a hard drive, start running the software as above, select the "Utilities" menu, and then choose "Install to another disk". Follow the instructions on the screen.

## **Working with a Stimulator**

To use the Pathway to control a stimulator, the stimulator must be configured properly and the Pathway must be connected via the stim interface cable. The stimulator must be configured with the ON TIME set for the maximum, the OFF TIME set for the minimum, and set to CONTINUOUS stimulation. Once it is verified the stimulator is working correctly, plug one end of the stim interface cable into the stimulator accessory jack and the other end into the stim out jack of the Pathway. The stimulator should now be controlled by the Pathway in the stim feedback mode. If the stimulator is ON when it should be OFF, change the polarity of the stim relay in the Pathway Special Functions mode. If the stimulator is not working correctly contact the dealer or manufacturer of the stimulator.

## **MR-25 QUICK REFERENCE**

### **START-UP DISPLAY:**

THE CURRENT BATTERY VOLTAGE IS SHOWN, WITH THE **BATT** LIGHT FLASHING IF THE BATTERY IS GETTING LOW. IF THE BATTERY IS TOO LOW TO USE THE DIGITAL DISPLAY WILL FLASH ALSO. (IF NECESSARY, SLIDE OPEN THE BATTERY COVER AND INSTALL A NEW ALKALINE BATTERY.) DURING THE SAME TIME PERIOD THE CURRENT STATE: **UNLOCKED** OR **LOCKED** IS INDICATED. THIS IS FOLLOWED BY THE CURRENT **SESSION** NUMBER, AND THEN THE REAL-TIME DISPLAY. EACH TIME THE MR-25 IS USED FOR AT LEAST ONE MINUTE OR ONE WORK PERIOD A SESSION IS SAVED IN MEMORY. UP TO 32 SESSIONS MAY BE SAVED FOR DOWNLOADING OR REVIEW. THE REAL-TIME DISPLAY SHOWS THE EMG LEVEL AND THE GOAL ON THE BAR GRAPH. THE NUMERICAL EMG VALUE IS SHOWN IN THE DIGITAL DISPLAY, SELECTED BY THE A OR B KEY.

### **GOALS:**

GOAL TYPES FOR EACH CHANNEL ARE CHANGED BY PRESSING THE A AND B KEYS. THE FIRST PRESS SHOWS THE CURRENT SETTING (FLASHING), AND ADDITIONAL PRESSES CHANGE IT. PRESSING NO KEY FOR A FEW SECONDS ACCEPTS THE CURRENT SETTING. THE GOAL VALUE IS CHANGED BY PRESSING THE UP AND DOWN ARROW KEYS FOR EITHER CHANNEL, WITH THE SAME PROCEDURES AS ABOVE. ALL OTHER FUNCTIONS OF THE MR-25 WORK IN A SIMILAR MANNER. THE CURRENT SETTING IS INDICATED BY THE FLASHING LIGHT, AND IS CHANGED BY PRESSING THE A AND B KEY. PRESSING NO KEY FOR A FEW SECONDS ACCEPTS THE CURRENT SETTING.

## **SPECIAL FUNCTIONS - SETUP OR REVIEW:**

ACCESSING THE SPECIAL FUNCTIONS ALLOWS THE FIRST CHOICE OF **SETUP** OR **REVIEW**. IF **SETUP** IS SELECTED THE **WORK/REST** OR **CONTINUOUS** MODE IS SELECTED. IN THE **WORK/REST** MODE THE WORK TIME, REST TIME, AND NUMBER OF TRIALS CAN BE CHANGED. WHILE THE VALUE IS FLASHING ANY OF THE UP AND DOWN ARROW KEYS INCREASE OR DECREASE THE VALUE. IF A STIM GOAL WAS SET, THE STIM ON TIME CAN BE CHANGED. NEXT THE **LOCKED/UNLOCKED** STATE MAY BE CHANGED, FOLLOWED BY THE REAL-TIME DISPLAY. IF **REVIEW** IS SELECTED RATHER THAN **SETUP**, EACH OF THE SAVED SESSIONS CAN BE REVIEWED. THE LAST SESSION IS REVIEWED FIRST. THE UP AND DOWN ARROW KEYS SELECT OTHER SESSIONS. FIRST THE SESSION NUMBER IS DISPLAYED, FOLLOWED BY THE # **TRIALS** OR **TIME** (# MINUTES). THEN THE AVERAGE EMG LEVEL IS SHOWN, FOLLOWED BY THE GOAL TYPE, AND % SUCCESS OR NUMBER OF STIMS. (FOR EMG AND GOALS THE A AND B KEYS SELECT WHICH CHANNEL IS BEING DISPLAYED.) THIS IS FOLLOWED BY THE CHOICE TO **SAVE** OR **CLEAR** ALL SESSION DATA. NOTE: SELECTING CLEAR WILL ERASE ALL OF THE SAVED SESSION DATA!!!

## **USING A FUNCTIONAL STIMULATOR:**

THE MR-25 STIM OUT JACK MUST BE CONNECTED TO THE ACCESSORY JACK ON THE STIM UNIT. IF THE STIM FIRES AT THE WRONG TIME CHANGE THE STIM RELAY SETTING ON THE MR-25. TO DO THIS HOLD DOWN THE B KEY WHILE TURNING POWER ON. THE CURRENT RELAY SETTING, OPEN OR CLOSED WILL BE SHOWN. CHANGE THE SETTING BY PRESSING THE B KEY ONCE. WHEN THE MR-25 DROPS INTO THE REAL-TIME DISPLAY THE RELAY SETTING WILL BE CHANGED.

**The Prometheus Group**  
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**603.749.0733 / 800.442.2325 (US & Canada) Fax: 603.749.0511**  
**E-Mail: [info@theprogrp.com](mailto:info@theprogrp.com) Web Site: [www.theprogrp.com](http://www.theprogrp.com)**

### **Standard Warranty Service Agreement**

The Prometheus Group warrants equipment of its own manufacture to be free from defects in material and workmanship as follows:

One year from the date of shipment to the original purchaser, subject to the terms, conditions, limitations , and exclusions specified herein.

1. Service: The Prometheus Group of New Hampshire, Ltd., hereafter “The Prometheus Group”, shall provide, for the term of this warranty, repair of defective “Pathway” units. This warranty shall include all parts and labor charges. The purchaser must obtain a Return Authorization Number and must return the defective unit, at the purchaser’s own expense to The Prometheus Group. The Prometheus Group may, at its option, repair and return the unit or provide a replacement unit. Should The Prometheus Group elect to provide a replacement unit, then this warranty is automatically transferred to the replacement unit. The Prometheus Group shall return, at The Prometheus Group’s own expense, the repaired or replacement “Pathway” unit.
2. Exclusions: The following conditions are excluded from service under this warranty:
  - A. Preventative maintenance. Preventative maintenance, defined as maintenance performed for the purpose of preventing a malfunction, is excluded from service under this warranty.
  - B. Repair of damage or malfunction of “Pathway” equipment resulting from abuse, accident, modification, or other cause other than normal usage, including but not limited to operator error, failure of other user-supplied equipment, and equipment operation in excess of design specifications is excluded from service under this warranty.
  - C. Loss due to fire, flood, robbery, burglary, theft, vandalism, radioactive contamination, or other natural disasters or Acts of God is excluded from service under this warranty
  - D. Replacement of batteries, accessories and expendables such as electrodes, are excluded from service under this warranty.
1. Optional Warranty Extension: This warranty may be renewed or extended by written agreement and acceptance of both parties. The price for such extension shall be the price in effect at the time the extension is put in force. The Prometheus Group shall waive any inspection and conditional repair requirements for uninterrupted warranty extensions.
2. Limitation of Remedy: The Prometheus Group shall not be liable for any damages caused by the delay in furnishing warranty services or other performance under this warranty. The service warranty expressed in paragraph 1 represents the sole and exclusive remedy for any warranty claims under expressed or implied warranties, including without limitation any warranty of merchantability or fitness. This warranty specifically limits the liability of The Prometheus Group, including liability for negligence claims by users and disclaiming any other claims of non-performance by The Prometheus Group. In no event shall The Prometheus Group be held liable for any incidental or consequential damages of any kind.
3. Assignment: This warranty shall not be assigned by the purchaser without prior written consent of The Prometheus Group. The warranty shall be binding upon all of the parties and their successors and assigns.