

DUAL CHANNEL EMG & NMS UNIT

INSTRUCTION MANUAL



CARE ETS™



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## Warnings

- \* This unit must be used with the guidance of a clinician or therapist
- \* Type BF equipment
- \* Continuous operation
- \* Do not immerse in water or any other substance
- \* Do not use the CARE ETS™ in the presence of a flammable anaesthetic gas mixture and air or with Oxygen or Nitrous Oxide
- \* Never connect the CARE ETS™ directly to a battery charger or to any other main powered equipment
- \* To avoid the effects of electromagnetic interference never use the CARE ETS™, in the EMG Mode, within 4 metres of a cellular telephone or near any other powerful radio interference producing equipment that produces electrical sparks etc. In the EMG Mode, the CARE ETS™ may be susceptible to strong interfering radio type emissions that may lead to temporarily increased EMG microvolt readings. The reading will immediately return to the correct value when the interference ceases. (Remember that a relaxed muscle should read below 3.5  $\mu$ Volts)
- \* Patient electrodes including all skin surface electrodes, vaginal electrodes and rectal probes are for single patient use only
- \* Do not use stimulation on your facial area



## Introduction

Care Rehab is proud to introduce the CARE ETS™, one of a new breed of modern EMG and Neuromuscular Stimulators. Our goal is to provide products that have high levels of functional use, are sensibly priced, compact and user friendly.

The CARE ETS™ is a dual channel combined EMG and Neuromuscular Stimulator. This makes the CARE ETS™ very flexible. The unit can be configured as a dual channel: EMG, EMG Triggered Stimulator (ETS) or purely a Neuromuscular Stimulator. Each modality has an individual menu which offers the therapist a wide choice of settings to choose from the various functions provided. These are: Duration, Pulse Width, Pulse Rate, Ramp up Time, EMG Threshold, Volume and Work / Rest Trials etc.

Additionally, the unit has a concealed button which enables the therapist to confirm patient compliance with a prescribed home treatment course.

Increasingly, EMG is being used to assist the therapist to diagnose and treat patients with a wide variety of conditions, and for patients themselves to improve from the visual and audible biofeedback EMG provides. Up until recently there has been little equipment available on the market for the therapist and patient to choose from at an affordable cost. The CARE ETS™ helps resolve these problems.

Neuromuscular stimulation is increasingly understood by therapists and Doctors. There is a better understanding of the mechanisms, which exist between nerves and muscles, that makes it possible to stimulate over the neuromuscular system with precise electrical signals. The CARE ETS™ offers precise signals giving full control of Pulse Widths, Rates, Ramp Up times, Work / Rest cycles as well as alternating or synchronous application if two channels are being applied.



## Contra-Indications and Precautions

### Neuromuscular Stimulation (NMS)

Before using this equipment you must first seek the advice of your Physician.

Neuromuscular Stimulation should not be used by:

- \* Patients fitted with demand style cardiac pacemakers
- \* During pregnancy
- \* Patients with undiagnosed pain conditions
- \* Do not place electrodes:
  - \* Over carotid sinus nerves
  - \* Over larynx or trachea
  - \* Inside mouth
  - \* On anaesthetised or desensitised skin
  - \* Do not drive a vehicle while the device is stimulating and attached to your person
- \* Skin irritation from the treatment of NMS or EMG itself does not occur, however, certain skin types do react to the tape if using rubber electrodes and, therefore, these patients should use hypoallergenic self adhesive electrodes supplied by Care Rehab
- \* The patient should only use the unit for which it was prescribed for
- \* Do not immerse the unit in water or any other liquid substance
- \* Do not use stimulation on your facial area

### EMG

There are no precautions when using EMG other than when using this form of treatment for Pelvic Floor exercising or assessment. EMG should not be used:

- \* During menstrual period
- \* If symptoms of bladder infection are present
- \* With patients who have diminished mental capacity or physical competence who cannot handle the device properly



## Features and Benefits

- \* Dual Channel EMG and Neuromuscular Stimulation
- \* Used as an EMG Biofeedback training aid or as a Diagnostic Tool
- \* Automatic & manual threshold setting in the EMG Triggered Stimulation mode (ETS).
- \* Measures stimulation time and average current used
- \* Measures EMG from 0.2 $\mu$ V and up to 2000 $\mu$ V
- \* Designed to be used for a wide range of physiotherapy applications.

### Concealed button enables Therapist to:

- \* Record time in use and average current used
- \* Lock work / rest periods from 1 - 99 secs
- \* Lock number of trials 1 - 99
- \* Lock ramp up time from 0.1 - 9.9 sec's
- \* Lock stimulation mA work levels
- \* Lock pulse rate selection from 2 - 100 Hz
- \* Record the total time of Stimulation and Average Stimulation current used
- \* Lock Pulse Width selection from 50 - 450  $\mu$ S
- \* Lock Alternating & Synchronous between Channels A and B
- \* Lock time 1 - 180 min's
- \* Customise programs, each consisting of up to 8 consecutive segments of specific Frequencies, Pulse Widths, Ramp Up Times, Duty Cycles and Duration
- \* 5 Pre-set Incontinence programs



## The CARE ETS™ System Components

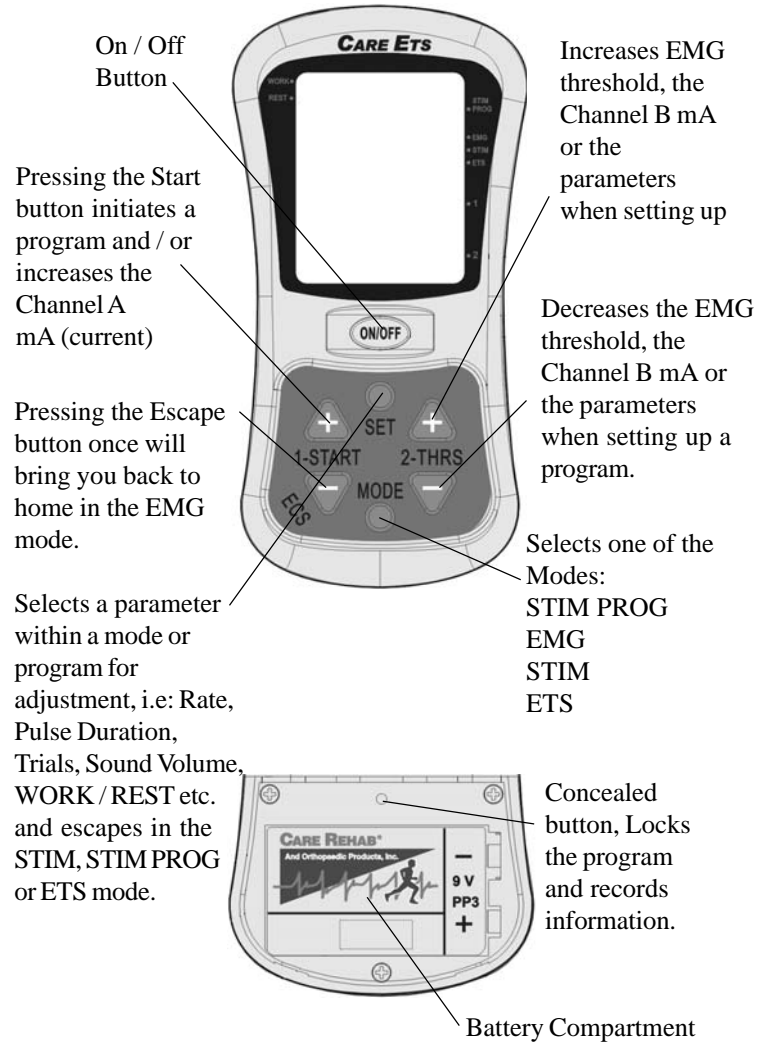


The CARE ETS™ System is provided with:

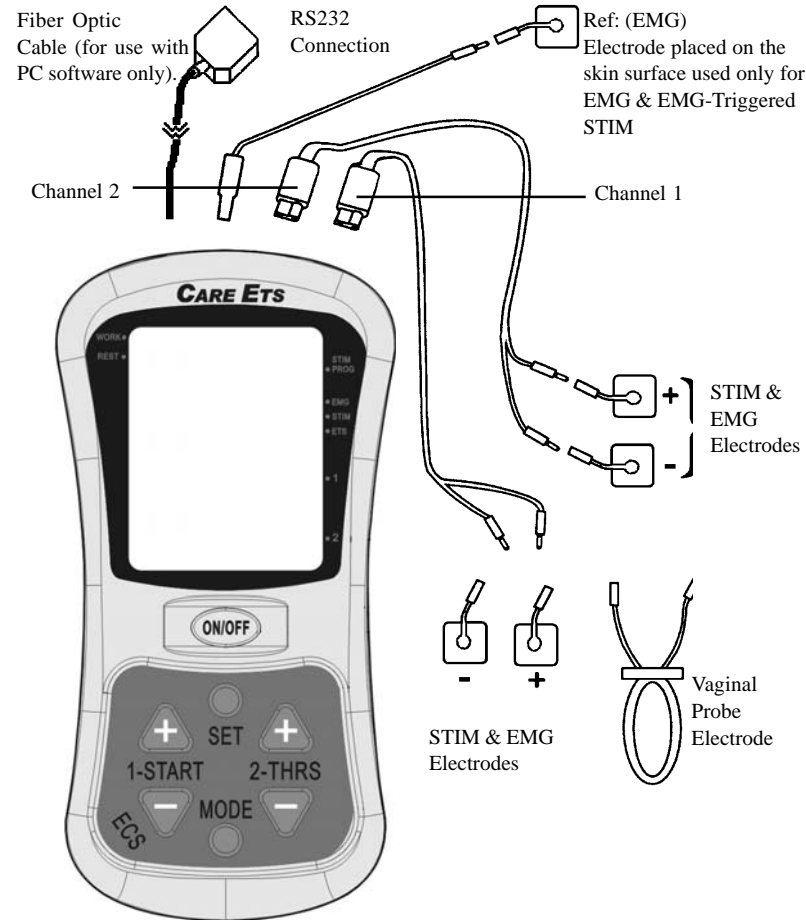
- 1 CARE ETS™ Stimulator
- 1 Package of Electrodes (non-sterile, 1.8" X 1.8")
- 3 Lead Cables
- 1 9V Battery
- 1 Operations Manual



## The CARE ETS™ Layout



# Lead / Electrode Connection Assembly



Note: The Ref EMG lead / electrode is only required for EMG and ETS. This lead / electrode is not required for Neuromuscular Stimulation.

If the unit is being used with an internal vaginal or rectal probe for EMG / STIM, the lead cable should be inserted into Channel 1. Channel 2 lead cable electrodes should be placed on the abdomen or Gluteus Maximus, but only if you require measuring the EMG on these areas.



## Quick Start Instructions

1. Insert a 9 Volt PP3 Alkaline battery.

Note: concealed button for locking the unit and home compliance. (refer to page 19)

2. Insert lead wires into Channel 1 and 2 for Neuromuscular Stimulation. For EMG or EMG Triggered Stimulation also insert lead wire into Ref. plug hole.
3. Switch on unit by pressing ON / OFF button.
4. Select STIM PROG, EMG, STIM or ETS by pressing the MODE button.
5. Having selected the configuration you want, press the SET button to move you through the set up menu.
6. Pressing the 2+ or 2- button to increase or decrease the various values i.e.: Time, Pulse Width, Volume etc.



Fibre Ref 2 1  
Optic





## STIM Mode

The STIM mode will allow the user to customize single stimulation programs for: Rate, Pulse Width, Work / Rest periods, Time, Ramp Up Time, Channel 2 on or off and Alternating or Synchronous, if Channel 2 is switched on.

Pressing the **SET** button consecutively takes you through a looped menu from which you can select the various parameters.

Example [As seen on the LCD screen]

Press the SET button consecutively

* <b>30</b> <b>W200</b>	LCD display shows current Rate and Pulse Width.
* <b>10</b> <b>RATE</b>	Press the 2+ or 2 – button to increase or decrease the Rate.
* <b>200</b> <b>WDTH</b>	Press the 2+ or 2 – button to increase or decrease the Pulse Width.
* <b>04S</b> <b>WORK</b>	Press the 2+ or 2 – button to increase or decrease the Work Time.
* <b>04S</b> <b>REST</b>	Press the 2+ or 2 – button to increase or decrease the Rest Time.
* <b>005</b> <b>MINS</b>	Press the 2+ or 2 – button to increase or decrease the Overall Time.
* <b>0.7</b> <b>RAMP</b>	Press the 2+ or 2 – button to increase or decrease the Overall Ramp Time
* <b>OFF</b> <b>CH2</b>	Press the 2+ or 2 – button to turn Channel 2 on or off.



**If you select Channel 2 [Dual channel] you can choose one of the following options.**

* <b>SYN</b>		Press the 2+ or 2- button to select <b>SYN</b> Synchronous or <b>ALT</b>
<b>1—2</b>		Alternating Channel <b>1-2</b> <b>1-2</b>

Press escape to return to the home screen. To start the program press 1+ or 2+.  
If the unit is being used with an internal vaginal or rectal probe for EMG / STIM the lead cable should be inserted into Channel 1.  
Channel 2 lead cable electrodes should be placed on the abdomen or gluteus maximus, but only if you require measuring the EMG on these areas.  
To escape from the program and cut the mA to 0, press the **SET** button.



## STIM PROG Mode

There are 5 set programs and 10 customized programs in STIM PROG MODE (For details of set programs, see page 14).

### Selecting a Set Program [Single Channel]

Press the MODE button so that the arrow lines up with STIM PROG. Press the SET button, then press the 2+ or 2- button to select one of the programs, then press the ESC button, then press 1+ button to start and increase the intensity. To decrease the mA intensity press the minus [-] 1- button. When the program is running, press SET to escape from the program and to set the mA level to 0.

### To Customize a Program


Press the SET button, then press the 2+ or 2- button to select the customized program, then press the SET button consecutively, which takes you through a looped menu from which the user can select specific settings by pressing 2+ or 2- button for Pulse Rate, Pulse Duration, Continuous or Work / Rest Stimulation, Ramp Up Time, Synchronous or Alternating and overall program Time.

### Example [As seen on the LCD screen]

Press the SET button consecutively .

* <b>PO6</b> <b>CUST</b>	Press the 2+ or 2- button to select a customized program between PO6 - P15.
* <b>OSG</b> <b>BLNK</b>	No segments set up no programs recorded and the segment is blank [This is only displayed if there are no segments set up].
* <b>1</b> <b>SEGM</b>	First stimulation program setting up the first stimulation segment.
* <b>10</b> <b>RATE</b>	Press the 2+ or 2- button to set the Pulse Rate between 2Hz –100Hz.
* <b>250</b> <b>WDTH</b>	Press the 2+ or 2- button to set the Pulse Width Duration between 50μS - 450μS.





## Built in set programs for Neuromuscular Stimulation

PROTOCOL P01 to P05	Hz Rate	P W $\mu$ S	Work time in seconds	Rest time in seconds	Overall time in mins
<b>PAIN RELIEF P01</b>	3	150	Continuous	0	20
<b>URGE P02</b>	10	250	4	4	25
<b>STRESS 1 P03</b>	30/40	200	4	4	25
<b>PELVIC FLOOR WORK OUT [ 60 MINS] P04</b>	<b>Sequential Stimulation</b> 20 Hz for 5 min's at 250 $\mu$ S Pulse Width 3 Hz for 5 min's at 250 $\mu$ S Pulse Width 10 Hz for 20 min's at 250 $\mu$ S Pulse Width 30 Hz for 8 min's at 200 $\mu$ S Pulse Width 40 Hz for 5 min's at 200 $\mu$ S Pulse Width 10 Hz for 7 min's at 250 $\mu$ S Pulse Width  Work/Rest time 4 sec's on 4 sec's off				
<b>WEEKLY MAINTENANCE [ 25 MINS] P05</b>	<b>Sequential Stimulation</b> 10 Hz for 10 min's at 250 $\mu$ S Pulse Width 40 Hz for 10 min's at 200 $\mu$ S Pulse Width 10 Hz for 5 min's at 250 $\mu$ S Pulse Width  Work/Rest time 4 sec's on 4 sec's off				
<b>CUSTOMIZED PROGRAMS P06 to P015</b>					

**Indications for use:**

- \* Relaxation of muscle spasms
- \* Prevention or retardation of disuse atrophy
- \* Increasing local blood circulation
- \* Muscle re-education
- \* Immediate post-surgical stimulation of calf muscles to prevent venous thrombosis
- \* Maintaining or increasing range of motion



## EMG Mode

Press the **Mode button** so that the arrow lines up with EMG on the LCD screen.

First the EMG threshold level [THRS] requires setting up as accurately as possible. The threshold level will vary from one patient to another. The threshold level is a goal or target at which a patient strives to achieve when contracting their muscles or and when performing exercises.

To set up the threshold the patient should be asked to contract and or perform the exercise holding the position for approx. 5 seconds and then relax between 5-10 seconds before repeating the contraction or movement. Note the microvolt  $\mu\text{V}$  reading displayed on Channel 1. The microvolt readings will change due to muscle variation.

Calculate the average of the two peak readings and set the threshold to between 40-50% of this.

Example: Average Peak reading:  $30\mu\text{V}$  take 40% of this value =  $12\mu\text{V}$  threshold setting.

To adjust the [THRS] threshold setting (at the top of the LCD screen) press 2-THRS + or 2-THRS – button.

### Setting the EMG parameters

\* Pressing the SET button consecutively takes you through a looped menu from which you can change the parameters for biofeedback sound volume, Work / Rest times, Trials, Above, Below, Continuous or Biofeedback sound off, Wide or Narrow Band setting, Channel 2 on / off, Feedback inhibit on or off and Channel 2 threshold.



**Setting up Work/Rest trials.**

**Example of what you may see on the LCD screen.**

Press the SET Button consecutively.



- |                             |  |
|-----------------------------|--|
| * <b>10</b><br><b>VOL</b>   | Press the 2 + or 2 – button to adjust the sound volume between 0 –10   |
| * <b>05S</b><br><b>WORK</b> | Press the 2 + or 2 – button to adjust the Work Time in seconds   |
| * <b>05S</b><br><b>REST</b> | Press the 2 + or 2 – button to adjust the Rest Time in seconds   |
| * <b>05</b><br><b>TRLS</b>  | Press the 2 + or 2 – button to adjust the number of trials [Repetitions]   |
| * <b>ABV</b><br><b>FDBK</b> | Press the 2 + or 2 – button to select one of the following biofeedback parameters  |
| * <b>ABV</b><br><b>FDBK</b> | Above feedback sound <b>BLW</b> below feedback sound <b>OFF</b><br>feedback sound off. <b>CNT</b> Continuous feedback sound<br><b>FDBK</b> |
| * <b>ON</b><br><b>SDAT</b>  | Press the 2 + or 2 - button to switch SERIAL Data on or off, Switch on if connected to PC (this will stop the device from turning off)     |
| * <b>WDE</b><br><b>FLT1</b> | Press the 2 + or 2 – button to select <b>WDE</b><br><b>FLT1</b> wide filter band or<br><b>NRW</b><br><b>FLT1</b> narrow filter band        |
| * <b>ON</b><br><b>CH2</b>   | Press the 2 + or 2 – button to switch Channel 2 on / off   |
| * <b>WDE</b><br><b>FLT2</b> | Press the 2 + or 2 – button to select <b>WDE</b><br><b>FLT2</b> wide filter band or<br><b>NRW</b><br><b>FLT2</b> narrow band filter        |



Electrodes placed on the legs, arms, face buttock or pelvic area use WIDE BAND setting.

All other areas i.e. abdominal, chest, shoulder, upper arms and back use NARROW BAND setting.

Narrow band setting is used due to the interference from the heart, this interference has to be eliminated.

- |                       |  |
|-----------------------|--|
| * <b>ON<br/>FBIH</b>  | Press the 2 + or 2 – button to select feedback inhibit on / off Feedback Inhibit [ <b>FBIH</b> ] is used when Channel 2 is switched on and where a patient is over using a muscle group and needs to learn how to relax the muscles. For example, over using the abdominal to contract the pelvic muscles.   |
| * <b>30<br/>CBTH</b>  | Press the 2 + or 2 – button to adjust Channel B [ <b>THRS</b> ] threshold. If [ <b>FBIH</b> ] is on and the patient when contracting their muscle keeps under the threshold level set, the biofeed back sound on Channel 1 will be audible. If the contraction on Channel 2 goes above the threshold then the audible biofeed-back sound on Channel 1 will disappear. This indicates that the patient has not relaxed their muscle sufficiently. Through biofeedback the patient will soon begin to learn to relax the muscles on Channel 2. |
| * <b>THR<br/>BRGH</b> | <b>RTO</b><br>Press the 2 + or 2 – button to change to <b>BRGH</b> ratio of 1:1 Channel 1 over Channel 2.<br>This parameter is used for Patellofemoral Pain Syndrome or similar applications   |
| <b>10<br/>VOL</b>     | <b>Back to the beginning</b>   |

Pressing the ESC button will record and store the program until it is re-programmed.

To start the program press 1 - START + button, to escape press the ESC button.

At the end of each session for example Work 5 seconds, Rest 5 seconds x 5 trials [Repetitions] the LCD display will highlight the statistics (described on page 18 and 20). The results will differ from one patient to another.



**EMG Statistics.**

**Press the SET button consecutively to read all the statistics.**

- |                              |  |
|------------------------------|--|
| <p>* <b>WRK<br/>AVG</b></p>  | <p>This is the work average for the session measured in [<math>\mu</math>V] microvolts. The average readings will vary from one patient to another.</p>                |
| <p>* <b>RST<br/>AVG</b></p>  | <p>This is the rest average for the session measured in <math>\mu</math>V - below 4 <math>\mu</math>V a muscle is beginning to rest.</p>                               |
| <p>* <b>AVG<br/>ONST</b></p> | <p>This is the average onset of muscle contraction measured in seconds, readings below 1 second can be considered normal.</p>  |
| <p>* <b>AVG<br/>RLSE</b></p> | <p>This is the average muscle release measured in seconds, readings below 1 second can be considered normal.</p>   |
| <p>* <b>W/R<br/>PEAK</b></p> | <p>This is the average peak value measured in <math>\mu</math>V - The value will vary from one patient to another.</p>   |
| <p>* <b>WRK<br/>AVDV</b></p> | <p>This is the average muscle deviation when contracting the muscle. Readings of below 20% of WRKAVG can be considered adequate, below 12% can be considered good.</p> |
| <p>* <b>RST<br/>AVDV</b></p> | <p>This is the average muscle deviation when the muscle is at rest. Below 4 <math>\mu</math>V a muscle is beginning to rest.</p>                                       |

When you have completed reading the statistics you can either continue to press the SET button to read the statistics again or press the ESC button to come out of the program. Once you have pressed the ESC button you will lose all the information.

If you are linked to the PC, the statistics can be saved for future reference.



## Recording Information

### To record and store the information for one patient

The unit will allow either EMG information to be stored or both EMG & Stim

- \* Remove the battery compartment cover
- \* Using a thin tubular instrument [End of the Lead Cables] press the concealed button in the small round hole just right of center once [See diagram on page 8] and you will hear two beeps, this indicates the unit is locked. To unlock after recording one or more sessions press the concealed button and you will hear one beep. Press the SET button consecutively to read all the statistics. After reading all the statistics, press the ESC button. The information at this point will be lost for good. If you are linked to the PC read the ETS software instructions for downloading patient recorded details. Note: Programs that are not completed will not be recorded

### Lock Function Mode

The purpose of the Lock Mode is to enable:

1. The clinician to accurately monitor compliance by the patient, while using the device at home.
2. To Lock in place a customized or pre-set program.

The Lock mechanism function only works in one of the following modes:

<b>EMG</b>	Measures EMG only
<b>STIM PROG (&amp; EMG)</b>	Measures EMG & Stimulation time in use and average mA current
<b>STIM (&amp; EMG)</b>	Same as above

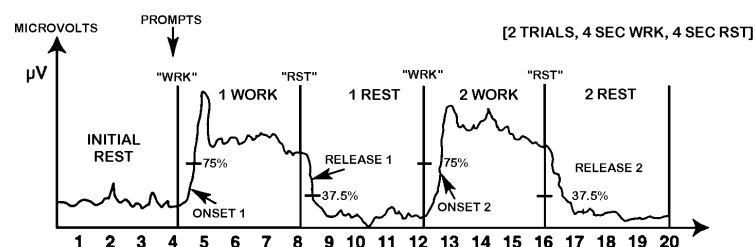
### To Set-up the Lock Function Mode

Program the unit for EMG and / or Stimulation as outlined on page 11 to 15 for STIM Page 16 -19 for EMG.

*Note:* While the unit is in operation only the volume-sound level, thresh hold and milliamps-current can be adjusted. Recording only occurs by pressing the 1 + **START BUTTON** and when the program is completed.



## Statistics



### EXAMPLE

Work / Rest Statistics automatically shown at the end of every Work / Rest cycle are derived as follows:

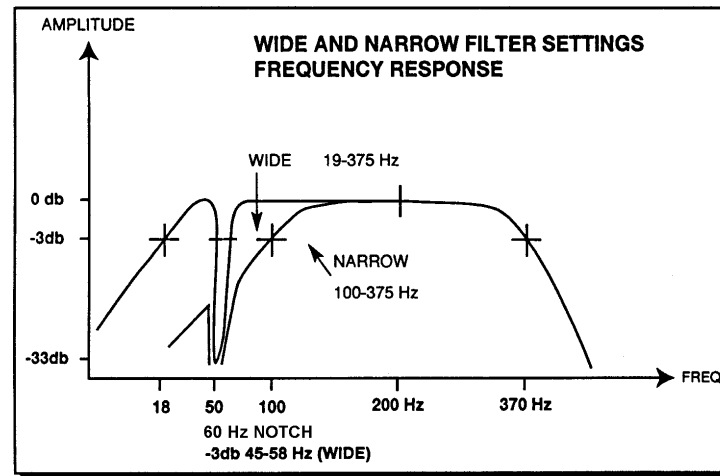
1. **WRK AVG** - Work Average: The average value in microvolts of all the Work segments excluding the first second of each segment.
2. **RST AVG** - Rest Average: The average value of the Rest segments excluding the first second.
3. **AVG ONST** - Average Onset: The average time taken after each respective "Work" prompt for Channel A to reach 75% of the average value of the third second of that particular work segment, or in the case that only two seconds of work has been selected then, Average Onset is the average of the time taken to reach 75% of the average value of the second second (after the "Work" prompt). If any Onset of the trials is more than 2 seconds then it (or they) will be rejected and the display will indicate the average of only those which were 2 seconds or less but a dash (-) before the number displayed will indicate this rejection. If all the Onsets were more than 2 seconds then the display will read AB2.


Concealed Button to Lock and Record a Patients Compliance





4. **AVG RLSE** - Average Release: The average time taken, after the REST prompt to reach 37.5% of the previous third second of work or as in item 3 above, the second second if only 2 seconds of work has been selected. As in the case of Onset, if any Release of the trials is more than 2 seconds then it (or they) will be rejected and the display will indicate the average of only those which were 2 seconds or less but a dash (-) before the number displayed will indicate this rejection.
5. If all the Releases were more than 2 seconds then the display will read AB2.
6. **W/R PEAK** - Work/Rest Peak: The peak value during the whole cycle of all the trials.
7. **WRK AVDV** - Average Deviation (per second) of Work. The average deviation of the quarter-second samples from the average value in the second in which they occur excluding the first second of each Work segment.
8. **RST AVDV** - Average Deviation (per second) of Rest. The average deviation of the quarter-second samples from the average value in the second in which they occur excluding the first second of each Rest segment.





## Setting EMG-Trigged Stimulation

Press the Mode button so that the arrow lines up with ETS on the LCD screen.

For EMG-Trigged STIM one has to set up the Stimulation parameters first and then the EMG, both in the same way as detailed under the headings STIM MODE and EMG MODE. The only difference for setting up EMG parameters is for **Electrode Discharge Time (ELDT), and Manual or Automatic patient Threshold setting.**

The EMG parameters need to be set up while the unit is in ETS Mode. If the patient were using vaginal or rectal probes that have stainless steel electrode conductors, then the ELDT would always be set to a 1-second delay time. The reason for building in the delay time is due to polarisation that takes place at the electrode site. This polarisation needs to disperse [depolarise]. This is achieved by building in a delay time before the CARE ETS™ performs the EMG cycle. When using normal adhesive skin electrodes, for periods of stimulation lasting 5—10 seconds, build in a delay time (ELDT) of 3—5 seconds, for periods of stimulation lasting longer than 10 seconds, build in a delay of 6—10 seconds.

- |                       |  |
|-----------------------|--|
| * <b>ON<br/>AUTO</b>  | Press the 2 - THRS + or 2 -THRS button to select automatic threshold. For manual setting select off and use the 2-THRS + to adjust the threshold setting any time during the EMG CYCLE |
| * <b>02S<br/>ELDT</b> | Press the 2 + or 2- buttons to increase or decrease the delay time.  |

The automatic threshold, when SELECTED automatically changes during the live program. If the patient finds achieving the threshold level too easy the threshold will automatically increase by 12.5%, conversely if the patient fails to achieve the threshold during the EMG Work period, it will automatically reduce the threshold by 12.5%.

**After the STIM and EMG has been set up, press the 1-START + button to initially increase the stimulation intensity level {m A} to a comfortable level. After releasing the button the WORK EMG will begin after 2 seconds plus the combined ELDT and REST time. The stimulation intensity can be changed any time during the work stimulation cycle.**



## Care and Maintenance

### Control Unit:

- \* Wipe the surface once a week with a damp cloth
- \* Do not use cleaning sprays or alcohol based cleaners

### Battery:

- \* Check periodically for any discharge from the battery
- \* Remove battery completely from unit if not in use for any extended period of time
- \* Low Battery indication of 7.4 volts shown on LCD display

### Lead Cables:

- \* The lead cables should be handled carefully and never stretched, as this can cause the EMG signal or electrical stimulation to function below normal standards or not at all
- \* Examine lead wires before each treatment for loose connections
- \* Avoid stretching and twisting the lead wires
- \* Store the lead wires carefully after each use

### Electrodes:

- \* Electrode life can be considerably reduced by:
- \* The type and condition of the skin
- \* Deep seated moisturizers or make-up

### For the Best Results:

- \* Before each use cleanse the skin
- \* After each use, place the pads (electrodes) on the shiny side of the insert card and store in a cool and dry place, such as the refrigerator

**Caution:** Static electricity may damage these products.

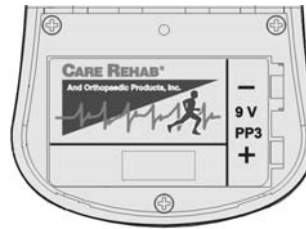
## CARE ETS™ Battery Information

Whenever removing or replacing the battery from your CARE ETS™, always remember to press the “ON / OFF” button to turn the unit off.

Always use one 9V alkaline battery when operating your CARE ETS™.

Do not use a rechargeable (e.g. nickel-cadmium) battery.

**Battery Care:** Remove the battery during storage to prevent damage caused by battery leakage or corrosion.





## Electrodes

### Reusable / Self-Adhering electrodes:

To use your electrodes, first attach them to your lead cable. (Note that the “pin” on the electrode cable is protected by a plastic sheath.) Then, grasp the electrode by the corner, and gently peel away the electrode from the plastic sheet it is provided with. Finally, apply the electrodes to the skin area (your physician or therapist will show you the approximate area for treatment) by firmly pressing the electrode against the skin.

When your therapy session is completed, grasp the corner of the electrode (**NEVER REMOVE THE ELECTRODE BY PULLING ON THE LEAD CABLE, AS THIS MAY DAMAGE YOUR ELECTRODES**)

and gently remove it from your skin, and place it on the plastic sheet it originally was adhered to. Another important note in the care of your electrodes is to replace the electrodes in the resealable pouch provided with your electrodes.

If your electrodes dry out, you can place a few drops of water on them to re-moisten them for continued use.

After repeated usage, reusable electrodes begin to lose their adhesion, deliver less stimulation and shorten battery life. **Replace reusable electrodes as needed.**

We recommend using 1.8” x 1.8” electrodes from Care Rehab.



## Proper Skin Care

*By properly caring for skin covered by electrodes, you will:*

- Allow more stimulation to reach the targeted nerves.
- Prolong the life of your electrodes.
- Reduce the chance that any skin irritation will develop.

The following directions for proper skin care will reduce the risk of skin irritation. However, if skin irritation develops, remove the electrodes, discontinue using your CARE ETS™, and consult your physician or therapist.

1. Wash all electrode sites with mild soap and water before applying the electrodes.
2. Dry your skin thoroughly before electrode application.
3. Trim excess body hair from electrode sites with scissors.
4. Do not place electrodes on cut, broken or irritated skin
5. Change electrode sites whenever possible, but first consult with your physician or therapist about doing this.



## Important Prescription Information

Please read the following prescription information carefully before using your CARE ETS™. If you have any questions regarding this information, consult with your physician or therapist before proceeding.

**CAUTION:** Federal (U.S.A.) law restricts this device to sale by, or on the order of a licensed physician. This device should only be used under medical supervision for adjunctive therapy for the treatment of medical diseases and conditions.

### Indications:

- \* Relaxation of muscle spasm
- \* Prevention or retardation of disuse atrophy
- \* Increasing local blood circulation
- \* Muscle re-education
- \* Immediate postsurgical stimulation of calf muscles to prevent venous thrombosis
- \* Maintaining or increasing range of motion

EMS devices should only be used under medical supervision for adjunctive therapy for the treatment of medical diseases and conditions.

### Contraindications:

- \* EMS devices are contraindicated for patients with cardiac demand pacemakers
- \* EMS devices should not be used on cancer patients
- \* Adequate precautions should be taken in the case of persons with suspected or diagnosed epilepsy
- \* Stimulation should not be applied over the carotid

### Warnings:

- \* The long-term effects of chronic electrical stimulation are unknown
- \* Safety has not been established for the use of EMS devices during pregnancy
- \* Adequate precautions should be taken in the case of persons with suspected heart problems
- \* Sinus nerves, particularly in patients with a known sensitivity to the carotid sinus reflex
- \* Stimulation should not be applied over the neck or mouth. Severe spasm of the laryngeal and pharyngeal muscles may occur and the contraction may be strong enough to close the airway or cause difficulty breathing



- \* Stimulation should not be applied transthoracically in that the introduction of electrical current into the heart may cause cardiac arrhythmias
- \* Stimulation should not be applied transcerebrally
- \* Stimulation should not be applied over swollen, infected, or inflamed areas or skin eruptions, e.g., phlebitis, thrombophlebitis, varicose veins, etc
- \* Stimulation should not be applied over, or in proximity to, cancerous lesions

**Precautions:**

- \* Safety of powered muscle stimulators for use during pregnancy has not been established
- \* Caution should be used for patients with suspected or diagnosed heart problems
- \* Caution should be used for patients with suspected or diagnosed epilepsy
- \* Caution should be used in the presence of the following:
  - When there is a tendency to hemorrhage following acute trauma or fracture
  - Following recent surgical procedures when muscle contraction may disrupt the

healing process

- Over the menstruating or pregnant uterus
- Over areas of the skin which lack normal sensation

- \* Some patients may experience skin irritation or hypersensitivity due to the electrical stimulation or electrical conductive medium. The irritation can usually be reduced by using an alternate conductive medium or an alternate electrode placement
- \* Electrode placement and stimulation settings should be based on the guidance of the prescribing practitioner
- \* Powered muscle stimulators should be kept out of the reach of children
- \* Powered muscle stimulators should be used only with the leads and electrodes recommended for use by the manufacturer
- \* Portable powered muscle stimulators should not be used while driving, operating machinery, or during any activity in which involuntary muscle contractions may put the user at undue risk of injury

**Adverse Reactions:** Skin irritation and electrode burns are potential adverse reactions.



## Interference

In the EMG mode the CARE ETS™ may be subject to Electromagnetic Interference. (see page 2 of the operating manual).

Additionally, the power supplies of some notebook computers can give off substantial amounts of interference to which the CARE ETS™ is susceptible.

This is particularly the case when the power supply "block" is the type with only a two pin connector connecting it to the mains with no earth.

As a precaution, make sure that the power cable from the notebook is as far away as possible from the patient connection wires of the CARE ETS™. (This does not include the fiber optic cable as it is, electrically, entirely non-conductive)

Try to keep the CARE ETS™ close to the patient's body (in the "field" of the patient) either on their lap, in their pocket or clipped to their belt. Also run the electrode wires along the surface of the patient's body keeping the wires as close to the surface of the patients body as is practically possible all the way from the electrodes to the CARE ETS™ and not dangling freely in space away from the patient.

A relaxed muscle should read below 3.5 microvolts ( $\mu\text{V}$ ). If you find that, even when the patient's muscle is soft and relaxed to the touch, you are still reading persistent, unexpectedly high  $\mu\text{V}$  levels, try turning off the notebooks external mains power supply. (The notebook will continue to run on it's own internal battery). If the  $\mu\text{V}$  reading(s) suddenly reduce and then go back up when you turn on the notebooks power supply then this is the cause of the interference. If this problem causes ongoing difficulties, please contact Care Rehab for assistance.



## Trouble Shooting

If you experience problems with EMG readings we recommend you make the following checks.

1. Check the lead cables for splits or breaks in the wire or at the end where the connectors are attached to the wire.
2. Check the lead cables of surface and or internal electrodes. Inferior surface electrodes will cause incorrect readings, we recommend you always use quality electrodes for EMG measurement.
3. If you are using a laptop computer and experience interference when using the charger, switch the charger off, if you still experience interference move to another area.
4. If you are using Vaginal or Rectal probes we recommend the patient uses conductive Gel as recommended by the Physiotherapist or Doctor.
5. Some patients vaginal aperture may be too large for some internal probes, causing intermittent contact with the walls of the pelvic muscle. In such cases one should try another larger electrode.
6. If you are connected to a laptop or desk top computer check to make sure the ends of the fiber optic cable are not damaged, as this will tend to obstruct the signal from the CARE ETS™ device to the computer.
7. If you are connected to a computer check to make sure there is no debris in the fiber optic connector, which is situated on the top left hand side of the device.

### Stimulation Mode

1. If you experience the current mA reverting back to zero it generally means that there is an open circuit between the input lead cables to the unit and the lead wires to the surface or internal electrodes. In such cases we suggest replacing the electrodes first. If this does not cure the problem check the lead cables to the unit.



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## Warranty

Care Rehab provides a warranty to the original purchaser that this product will be free from defects in the material, components and workmanship for a period of 1 year from the date of purchase (invoice date). If Care Rehab is satisfied that the product(s) is defective the purchaser may return this unit(s) to Care Rehab or the appointed distributor for repair or replacement of a new unit. All returns must first be authorized by Care Rehab in advance. The liability of Care Rehab under this limited product warranty does not extend to any misuse or abuse such as dropping or immersing the unit in water or other liquid substance or tampering with the unit or normal wear and tear. Any evidence of tampering will nullify this warranty.

### Customer Service

Any queries should be addressed to:

Care Rehab  
PO Box 580  
McLean, VA 22101

Tel: 1-(703)-448-9644  
Fax: 1-(703)-356-2182



## Technical Specifications

### Electrical

#### 1. EMG

- 1.0 Dual Channel
- 1.1 EMG Range: 0.2 to 2000  $\mu$ V RMS (continuous)
- 1.2 Sensitivity: 0.1  $\mu$ V RMS
- 1.3 Accuracy: 4% of  $\mu$ V reading  $\pm$ 0.3  $\mu$ V at 200 Hz
- 1.4 Selectable Bandpass Filter - 3db Bandwidth,
  - a. Wide: 18 Hz  $\pm$  4 Hz to 370 Hz  $\pm$  10% - Reading below 235 microvolts  
10 Hz  $\pm$  3 Hz to 370 Hz  $\pm$  10% - Reading above 235 microvolts
  - b. Narrow: 100 Hz  $\pm$  5% to 370 Hz  $\pm$  10%
- 1.5 Notch Filter: 60Hz - 33 dbs (0. 1% accuracy)
- 1.6 Common Mode Rejection Ratio: 130 dbs Minimum @ 50 Hz
- 1.7 Battery: PP3 Alkaline
- 1.8 Work / Rest periods: 2-99 seconds
- 1.9 Number of Trials: 1-99

#### 2. Neuromuscular Stimulation

- 2.1 Dual Channel: Individually isolated circuits
- 2.2 Amplitude: 0-80 mA: Indication only: actual mA will tend to be less than indicated due to Electrode impedance.
- 2.3 Type: Constant current
- 2.4 Waveform: Asymmetrical, Rectangular, Bi-Phasic with net zero DC current
- 2.5 Pulse Width selection: 50-450  $\mu$ S (2% accuracy)
- 2.6 Pulse Rate selection: 2-100 Hz (2% accuracy)
- 2.7 Output: selectable Synchronous or Alternating between Channels 1 & 2
- 2.8 Work / Rest periods: 2-60 seconds
- 2.9 Time 1 - 180 minutes
- 2.10 Ramp Up Time: 0.1 - 9.9 seconds
- 2.11 Preset and user programmable treatment programs
- 2.12 Automatic output shut off with detection of open electrode above 11 mA



Low battery indication at 7.4 volts +/- 0.2 volts and automatic shut off 4 minutes after last key pressed, unless infra-red is turned on.

**Environmental conditions for storage & transport:** -14 to +95 degrees Centigrade.  
0-90% Humidity.

**Physical**

Dimensions: Length: 5.3 inches, Width: 2.7 inches, Depth: 1.1 inches

**Weight**

6.5 Ounces





PO Box 580  
McLean, VA 22101

Phone: 1-703-448-9644 Fax: 1-703-356-2182