GLOSSARY OF TERMS ASSOCIATED WITH TENS

**ATP** - Adenosine Triphosphate that helps to promote protein synthesis.

**Accommodation** - Becoming accustomed to stimulation resulting in nerve and muscle fatigue.

**Acute Pain** - Sudden, severe and of short duration.

**Alternating Current (AC)** - Uninterrupted flow of charged particles that reverses itself at regular intervals.

**Amplitude Modulation** - Variation or change in the magnitude of the current over a period of time.

**Anesthesia** - Loss of sensation and consciousness

**Analgesia** - A pain sensation-free state without loss of consciousness.

**Asymmetric** - Unbalanced or unequal.

**Beat Frequency** - The intersection and temporal summation of two or more electrical waves that differ in frequency.

**Beta Fibers** - Nerve impulse transmitters.

**Biofeedback** - Automatic bodily response to a stimulus used to acquire voluntary control of the response.

**Biphasic** - Two electrical phases: one positive, the other negative.

**Bipolar Stimulation** - The use of two electrodes.

**Bipolar Polarity** - Electrical current above and below the baseline.

**Brain Wave Rhythms** - Alpha, beta, delta, and theta

**Burst** - A finite series of pulses followed by a pause or interburst interval.

**Carrier Frequency** - A frequency within a pulse.

**Calcium** - Deficiency or excess of serum calcium causes nerve and muscle dysfunctions and abnormal blood clotting.
Central Nervous System - Brain and spinal cord.

Chronic Pain - Constant Pain that continues for months or years.

Constant - Continuous stimulation, no change in pattern.

Contraindications - Any condition that makes a particular treatment inadvisable.

Cycled - Electrical timing functions cycling through ramp, on and off times.

Decubitus Ulcers - Wounds resulting in prolonged sitting or lying becoming inflamed and ulcerated.

Delta - Brain wave rhythm of 1-4 cycles per second. A state of deep dreamless sleep.

Dermatomes - The skin area supplied with nerve fibers by a single posterior spinal root.

Diathermy - Heat therapy associated with high frequencies of 10,000pps and higher.

Direct Current (DC) - An uninterrupted flow of charged particles that flows in one direction.

Distally - Situated away from the center of the body or point of origin.

Edema - The swelling of the body tissue.

Endorphins - A morphine-like substance released by the pituitary gland to decrease pain.

Enkephalins - See endorphins. Enkephalins also inhibit the pain causing chemicals (prostaglandins) from passing messages to the brain.

Electrodes - The terminal through which electrical stimulation is applied to the body.

Frequency - Number of cycles of carrier wave per second. Also known as Pulses Per Second (pps), Hertz (Hz), and Pulse Rate.

Frequency Shifts - An abrupt change in frequency used to excite different tissue levels and to prevent accommodation.

Frequency Swing - A slow adjustment to the frequency used to excite different tissue levels and to prevent accommodation.
**Gate Theory** - Hypothetical ‘Gate’ which blocks pain from reaching the brain.

**Hertz** - Unit of frequency equal to one cycle per second, See Frequency.

**High Frequency** - In Pain Management and TENS classification of high frequency is greater than 50pps. In NMS and Multi-Frequency Devices high frequency is associated with heat or diathermy at frequencies greater than 10,000pps.

**Impulse** - Wave of excitation in nerve causing action or inaction of muscles.

**Indications** - An indicator for a particular treatment.

**Inflammation** - Process affecting the part of the body with heat, swelling, and redness.

**Interference current** - The current that interacts with the adjustable current resulting in a beat frequency.

**Low Frequency** - In Pain Management and TENS classification of low frequency is 1-20pps. In NMS and Multi-Frequency Devices low frequency is associated with minimum frequency required for tetany in the ranges of 1-1,000pps.

**MENS** - Micro current Electrical Nerve Stimulator.

**Maximum Sensory Threshold** - Where the effectiveness of the Gate Theory and Endorphin release is at an optimum.

**Medium Frequency** - Technically defined as 1,000 to 10,000pps

**Meridians** - Lines of transmission through the body.

**Microamplitude** - Maximum value of current measured from the baseline represented by the symbol uA, 1/1000 of 1 Milliamp.

**Milliamplitude** - Maximum value of current measured from the baseline represented by the symbol mA.

**Modes of Operation** - Types of stimulation patterns such as Burst, Modulation, and Continuous.

**Modulation** - The altering of the pulse rate and or pulse width and or amplitude of the pulse.

**Motor Neurons** - Nerve cells of the brain.
**Muscle** - Strong tissue composed of fibers that have power of contraction to produce movement of the body.

**NMS** - Neuro Muscle Stimulators

**Nerve Fibers** - A bundle of conducting fibers enclosed in the epineurium for the transmission of impulses between any part of the body and nerve center.

**Nerve Stimulation** - Caused by minute electrical impulses through the electrodes to the nerve endings.

**Neurons** - Brain nerve cells.

**Neuro Transmitter** - A chemical that is released from one neuron into the synaptic junction (gap) between it and another neuron.

**Ohm** - Electrical resistance measurement.

**Ohm’s law** - \( V=IR \). The potential difference (V) across a pure resistor is directly proportional to the current flowing through the resistor.

**Peripheral Nervous Systems** - Those parts of the nervous system lying outside the central nervous system.

**Phantom Limb** - a feeling of an arm or leg that has been amputated still exists.

**Polarity** - Electrical condition of either positive or negative from baseline.

**Post Operative Pain** - Pain suffered after an operation.

**Potentiometers** - Instrument for measuring or adjusting electrical potential.

**Pre-Programmed** - Modes of operation are preset and cannot be changed.

**Protracted Pain** - Pain that continues for weeks, sometimes months.

**Proximal** - Nearest the point that is considered the center of a system. (E.g. central nervous system).

**Pulse Amplitude** - The measure of the magnitude of current with reference to the base line measured in Milli amplitude or Micro amplitude.

**Pulse Duration** - See pulse width.
**Pulse Rate** - Output rate of pulses generated per second.

**Pulse Width** - The time elapsed from the beginning to the end of all phases within one pulse measured in microseconds.

**Ramp** - Sequential increase or decrease in amplitude, width, or rate.

**Rise Time** - The time for the leading edge of the phase to increase from the baseline to peak amplitude of the phase.

**Sensory Nerve Fibers** - Convey impulses from the periphery towards the brain or spinal cord.

**Strength Duration** - Stimulation that follows the Maximum Sensory Threshold.

**TENS** - Transcutaneous Electrical Nerve Stimulator

**Transcutaneous** - Through/ beneath the skin.

**Volts** - Unit of electromotive force the difference of potential that would carry an ampere of current against an OHM resistance.

**Wave Forms** - Different electrical forms or patterns emitted through the electrodes to the skin.