CLINTON INDUSTRIES, INC

207 Redneck Ave. Little Ferry, NJ 07643
PHONE: 201 440 0400 / FAX: 201 440 5040
EMAIL: general@clintonind.com

Bar Tacker
1190tkr

July 2011 by Peter Schueler

There is a slightly difference between the former 8000 series and the new M16 system.

Power-On:

Never connect the motor (power or encoder cable) <u>after</u> the power is turned ON !

LCD- display box (Programmer)
To connect or disconnect the LCD- box, the power has to be turned <u>off</u>
to initialize the system after power-on
Going to the "Hidden Parameters" or "MASTER RESET":
Please read the procedure carefully at page 3

The new system with the large motor needs a synchronizer, mounted to the hand wheel.

The synchronizer is replaced by a disc with one position.
The position is set to "Needle Up" (take-up up)

Pulley ratio:
In order to get the selected speed at the sewing machine and not at the motor,
The pulley ratio between motor pulley and machine pulley (hand wheel) has to be taken.
This happens after a "MASTER RESET" or a special procedure to take the ratio. The display reads: "TAKE NEW RATIO"
The ratio is verified after each power-on.
In case of the change of the pulley, new ratio will be taken.

How to force to take a new ratio:
1. The power has to be turned on.
2. Press the "NEEDLE-UP/NEEDLE-DOWN" and the "SBT" buttons at the same time.
3. Turn the power off.
4. Wait for the message "GOOD BYE< SEE YOU"
5. Turn the power back on before the message disappears
6. Held both buttons down until the massage "RELEASE BUTTONS" appears.
7. Release the buttons. Now the display should read "TAKE NEW RATIO"

Access to "HIDDEN PARAMETER"
A) If the power is OFF, turn it ON (the display reads "*OPERAION MODE*")
B) Turn the power OFF (the display reads *"good bye, see you"*)
C) Hold down the "NU/ND", and the "ARROW-RIGHT" buttons
D) Turn the power back ON <u>before the display gets blank</u> (very important!)
E) Held the buttons down until a string of stars is displayed.
F) Release the buttons and push the "SET" button before the stars disappear. The access to the "HIDDEN PARAMETER" is enabled. Power OFF will disable the access.

MASTER RESET
Caution: This procedure will overwrite the whole parameter set with the default settings!

A) If the power is OFF, turn it ON (the display reads "*OPERAION MODE*")
B) Turn the power OFF (the display reads *"good bye, see you"*)
C) Push and hold down the "NU/ND", the "ARROW-RIGHT" <u>and</u> the "ARROW-UP" buttons
D) Turn the power back ON <u>before the display gets blank</u> (very important!)
E) Held the buttons down until the displayed message alternates between: *"PUSH SET"* and *"FOR RESET"*
F) Release the buttons and push the "SET" button within ten (10) cycles. The display reads: "PROGRAMMING"
NOTE: if the "SET" button is not pushed within 10 cycles, the program goes to the main menu without executing the MASTER RESET.
Access to the "HIDDEN PARAMETER" is enabled to make important settings such as speeds and needle-positions.

7.1.0 Using the Built-in Test Program

To enter: Press simultaneously the ARROW- RIGHT and the SBT button., release the ARROW-RIGHT button first! Otherwise you are back in the main program!
  The display should read: TEST MODE

  To go to the first group, press the "ARROW-ROUND" button
  The display reads: TEST TREADLE   for about 2 seconds
  Then it reads the position of the threadle:

  This can be: 1. NEUTRAL
                         2. FORWARD and a number
                         A)   HEEL 1
                         B)   HEEL 1 / HEEL 2
  If the threadle is in forward position, the displayed number is the reading of the ADC- converter.
  The lowest number should be below ten (10) and the highest number at least 245

  To go to the next group, press the "ARROW-ROUND" button again
  The next group is: test synchronizer
  Turn the hand wheel and the display reds all 3 positions:
   NEEDLE-UPor/ NEEDLE-DOWN or TRIM

  To go to the next group, press the "ARROW-ROUND" button again
  The next group is: test inputs
                       (this will be displayed for two seconds)
  Then activated inputs are displayed
  If no inputs are activated, the display reads   " ----------------   "

  To go to the next group, press the "ARROW-ROUND" button again
  The next group is: test outputs

  After two seconds, the display reads: -1- PRESSERFOOT

  To activate the output, press the "NEEDLE-UP / NEEDLE-DOWN button.
  To go to the next output, press the "ARROW-UP" button.
  The next reading is;   - 2 – NEEDLE COOLER
  To go to the next output, press the "ARROW-UP" button.
  To go to the former output, press the "ARROW-DOWN" button

To go to the next group, press the "ARROW-ROUND" button again

The next group is: **Test Encoder / Index**

The LCD- display reads the number of pulses of the encoder. Turn the hand wheel

And the number counts up or down, dependent on the direction. The index signal resets the counter at 2000 (up) or 1 (down). If the encoder counts up and the number changes at 2000 to 1, every thing is fine.

To go to the next group, press the "ARROW-ROUND" button again

The next group is: **Test Motor (Balance)**

This test allows testing the "balance" of the motor. If this adjustment is not correct, the motor turns hot while operating.

To perform the test the motor has to be disconnected from the machine.

Push the NU/ND- button, the motor starts running with a low speed (100 rpm) for about three revolutions. The display reads: "WAITING FOR INDEX"

After the motor stops, the following message will be displayed:

"CALCULATE OFFSET". When the offset is calculated, the result will be displayed: "ADJUSTMENT: + xx " or "ADJUSTMENT – xx"

"+xx" or "- xx" represents a number. This number should not be higher then 15.

If the reading is not correct, please repeat the test (Press NU/ND again).

5.6 counts is one degree.

Display the PIN (Program Identification Number)

1. **Turn the power OFF**
2. **Press the pedal forward**
3. **Turn the power ON while the pedal is held in the forward position (Don't worry, the machine (Motor) will not move)**
4. **The LCD- display reads the PIN as long as the pedal is held down**

Indicator LED's at the front panel:

Yellow: No encoder pulses detected at power-on
The program could not set the position of the hand wheel. Check the encoder pulses !
Red: Over current error (Motor)

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Download a "HEX"- file to program a memory chip (E- prom) for the new M16

system:

The external program for the M16 system starts at address "F0000" HEX and ends at "FFFFF"
The addresses from 00 to "EFFFF" are reserved for the internal ROM (or flash memory) of the CPU.
Because the .ORG of the program is set to "F0000hex the program will be downloaded at a higher address (This depends on the size of the buffer of your programmer.

A)   **Fill the buffer of your programmer complete with "FF"hex (recommended)**
2.   **Download the hex file into the buffer of your programmer**
3.   **Check out where the program starts. This can be "70000" or "F0000" This address depends on the size of the programmers memory.**
A)   **Move the complete hex file to address "00000" and program the e-prom.**

Your programmer has no "MOVE" command?
In this case you change the starting address of the buffer from "0000" to the address where the program starts.
Keep the device address "0000"

MODES OF OPERATION:

The LCD display can be operated in three (3) different modes.
They are:
   1.   OPERATING MODE: To operate the machine
   2.   PROGRAMMING MODE: To change a parameter
   3.   TEST MODE   An easy way to maintain and check the system.

Two different parameter levels are available:
                    OPERATORS LEVEL (Basic)
                    MECHANICS LEVEL (Advanced)

To use the MECHANICS LEVEL, please see the section 2.0.0 (Access to "HIDDEN
PARAMERTERS)

1.0.0.   HOW TO CHANGE A PARAMETER:
         Four parameter groups are available (OPERATORS LEVEL)
                    SPEEDS
                    TIMERS
                    COUNTERS
                    TOGGLE SWITCHES.
         To change a parameter, please proceed the following sequence:

STEP 1
                Push the 'ARROW ROUND' button repeatedly until the desired
                parameter group is displayed.
STEP 2
                Push the 'SET' button repeatedly until the desired parameter is
                displayed
STEP 3
                Change the parameter with the buttons:
                    'ARROW-UP'   (increase the value)
                or   'ARROW DOWN'   (decrease the value)

         In the group 'TOGGLE SWITCHES' , either button, "ARROW UP" or
         "ARROW DOWN" will toggle the parameter.

PLEASE NOTE:
To optimize a certain parameter, it may be necessary to go repeatedly from the operation mode
back to the same parameter.
It can be easy done by pressing the 'SET' button.
If the program is in the OPERATION MODE, the SET button takes you right back to the last
displayed parameter.
Exemption:
If you are in the group "TOGGLE SWITCHES", the "SET" button brings you to the first parameter of the group "TOGGLE SWITCHES"

If a parameter was changed by accident and the machine doesn't work properly, it is possible
to go back to the original factory setup by using the feature of the MASTER RESET (section 3.0.0).

4.0.0 Operators Parameters:

4.0.0   **SPEEDS: rpm (spm, stitches per minute)**

4.0.1   Soft Strt.   Soft start after End of Cycle
                              Range: 150 to 1000
                              Steps: 10
                              Default: 700

4.0.2   END SPD   END SPEED
                              Range: 150 to 1000
                              Steps: 10
                              Default: 700

4.1.0   **TIMERS   ms (milliseconds)**

4.1.1 START   Start Delay
                              The delay from presser foot down to start.
                              If the foot is already down, this time will not affect.
                              Range: 30 to 2500
                              Steps: 10
                              Default: 60

4.1.2 Wiper   Wiper Time
                              Range: 10
                              Steps: 10
                              Default: 80

4.1.3 Pivot   Pivot Time: After finishing the cycle and the pedal
                              is still held down, the machine starts the next cycle
                              after this time.
                              Range: 10 to 250
                              Steps: 10
                              Default: 80

4.4.0   **COUNTERS, (Numbers of Stitches)**

4.4.1 Soft St   **Soft Start after End of Cycle**
                 Range   **1 to 30**
                 Steps   **1**
                 Default   **3**

4.4.1 ENDcnt   **End Count**
                 Range   **8 to 30**
                 Steps   **1**
                 Default   **10**

4.6.0 TOGGLE SWITCHES

4.5.3   **Slow End**   **ON / OFF**
                             Default: **OFF**

4.5.4   **Soft Start**   **ON / OFF**

                             Default: **OFF**

5.0.0 HIDDEN PARAMETER

5.1.0 *** SPEEDS (rpm)**

5.1.1   **MIN/TRM**   **Minimum and Trim Speed**
                        Range: **30 to 600**
                        Steps: **10**
                        Default: **230**

5.1.2   **MAXIM.**   **Maximum Speed**
                        Range: **500 to 3500**
                        Steps   **100**
                        Default: **1800**

5.1.3   **POS.TL.**   **Position – Tail - Speed**
                        Range: **50 to 200**
                        Steps: **1**
                        Default: **50**

5.4.0 ****** MISCELEN   (Miscellaneous)

Presser foot or Needle Cooler duty cycle: Due the voltage is too high to turn a solenoid permanent on all time, the curr7ent is turned on only permanently a short time, after that, the current has to be chopped. For example: Duty cycle 40% means 40% on, 60% off
If the duty cycle is too low, the solenoid will not stay on.
If too low, the solenoid will turn too hot!

5.4.1   NC 100%   Needle Cooler on 100 %
Range	**10 to 2000**
Steps:	**10**
Default:	**200**

5.4.2   NC DUTY   Needle Cooler duty cycle
Range	**10 to 100**
Steps:	**10**
Default:	**50 (50%)**

5.4.3   Clp 100%   Clamp-on 100%
Range	**10 to 2000**
Steps:	**10**
Default:	**200**

5.4.3   ClpDUTY   Clampduty cycle
Range	**10 to 100**
Steps:	**10**
Default:	**50 (50%)**

Acceleration / Deceleration Ramp:
The lower the number, the slower the Ramp!

5.4.3   ACCEL   Acceleration ramp
Range	**15 to 50**
Steps:	**1**
Default:	**30**

5.4.3   DECEL   Deceleration ramp
Range	**15 to 50**
Steps:	**1**
Default:	**30**

5.5.0 ****TOGG SW   TOGGLE SWITCHES

5.5.1   DIRECTN   Direction of Rotation (CCW / CW)
                        Default: CW (Clockwise)

5.5.4   SHOW REGS "NO" / "YES"
                        Default: NO   Do not CHANGE !