

# molex®

**Crimp Force Monitor  
Instruction Manual  
Order No. 63800-7950**

## Safety Warnings and Information

	<p><b>Read and understand</b> all of the instructions and safety information in this manual before operating or servicing this tool.</p> <p style="text-align: center;"><u>Keep this manual available when using this tool.</u></p> <p style="text-align: center;">Replacement manuals are available for download at no charge at <a href="http://www.molex.com">www.molex.com</a>.</p>
---	---

<b>SAFETY ALERT SYMBOL</b>	
<p>This symbol is used to call your attention to hazards or unsafe practices which could result in an injury or property damage. The signal word, defined below, indicates the severity of the hazard. The message after the signal word provides information for preventing or avoiding the hazard.</p>	
 <p><b>DANGER</b></p>	<p><b>DANGER:</b> Indicates an imminently hazardous situation which, if not avoided, could result in death or serious injury.</p>
 <p><b>WARNING</b></p>	<p><b>WARNING:</b> Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.</p>
 <p><b>CAUTION</b></p>	<p><b>CAUTION:</b> Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. <b>CAUTION</b> may also be used to alert against unsafe practices associated with events that could lead to personal injury.</p>

	<p> <b>WARNING</b></p> <p><b>Always</b> wear proper eye protection when operating or servicing a press.</p> <p>Failure to wear eye protection could result in serious eye injury from flying debris during test.</p>		<p> <b>WARNING</b></p> <p><b>Never</b> install or service this unit while connected to any electrical power source. Disconnect power by unplugging the AC adapter.</p> <p>Failure to observe this warning could result in severe injury or death.</p>
	<p> <b>WARNING</b></p> <p><b>Never</b> operate, service, install, or adjust this equipment without proper instruction and without first reading and understanding the instructions in this manual and all applicable press and/or wire processing machine manuals.</p>		<p> <b>WARNING</b></p> <p><b>Do not use</b> compressed air to clean this equipment. The forces created by compressed air can force debris into the unit.</p> <p>Failure to observe these precautions may result in injury or property damage.</p>
	<p> <b>WARNING</b></p> <p><b>Never</b> operate a press without safety devices that are intended to prevent hands from remaining in the tool.</p> <p>Failure to observe this warning could result in severe injury or death.</p>		<p> <b>WARNING</b></p> <p><b>Do not</b> expose this equipment to moisture. To prevent fire and shock hazard, always unplug the AC line cord prior to servicing.</p> <p>Failure to observe this warning could result in severe injury or death.</p>

 **WARNING**

**Do not** exceed the rated force capacity of the sensor. The unit may be damaged, and the operator or others in the immediate vicinity injured under extreme force conditions.

**Do not** remove the disassemble the display module. Disassembly will void the warranty.

 **CAUTION**

**Never** perform any service or maintenance other than as described in this manual.  
**Never** modify, alter or misuse this equipment

Failure to observe this precaution may result in injury and / or property damage.

## Application Tooling Technical Assistance

Application tooling technical assistance is available for customers who may need some guidance for tooling adjustments. This support can be accessed by calling either of the two numbers listed below and asking for the Molex Tooling Group.

Call Toll Free 1-800-786-6539(US) 1-630-969-4550(Global).

This assistance is limited to the operation and set-up of a customer's Molex tool. Questions with regard to Molex connector products or how to identify the proper tooling and/ or tooling documentation should be directed to your local Molex personnel or Customer Service Representative.

When calling for service on the crimp force monitor it is recommended to have the following: a copy of this Tooling Manual and a person familiar with the crimp force monitor should be present. The following information is also recommended to supply:

1. Customer name
2. Customer address
3. Person to contact such as (name, title, e-mail, and telephone number)
4. Crimp force monitor part number (638007950)
5. Urgency of request
6. Nature of problem

**Molex Application Tooling Group**

2200 Wellington Court  
Lisle, IL 60532, USA  
Tel: +1 (630) 969-4550  
Fax:+1 (630) 505-0049

Visit our Web site at <http://www.molex.com>

# Table of Contents

## Contents

Safety Warnings and Information .....	2
Application Tooling Technical Assistance.....	3
Section 1.....	5
General Description.....	5
1.1 Features .....	5
1.2 Technical Specification.....	5
1.3 Description .....	5
1.4 Delivery Check .....	6
1.5 Tools .....	6
Section 2.....	7
Setup and Installation.....	7
2.1 Controls Overview of the Crimp Force Monitor .....	7
2.2 Set-Up .....	8
2.3 Ram Sensor Installation .....	8
2.4 Mounting the Control Module .....	8
2.5 Cable Connections .....	9
2.6 Power Supply Connection .....	9
Section 3.....	10
Operation.....	10
3.1 Learning a Process .....	10
3.2 Auto-Gain Feature.....	10
3.3 Information Screen .....	10
3.4 Run Screens.....	11
3.4.1 Main Screen.....	11
3.4.2 Counter Screen.....	12
3.5 Operator Interaction .....	12
3.5.1 Password Access.....	12
3.5.2 Press Inhibit .....	13
Section 4.....	14
Process Setup.....	14
4.1 Signature Analysis and Tolerances.....	14
4.2 Part Number Database.....	14
4.2.1 Loading a Part Number.....	15
4.2.2 Creating a New Part Number .....	15
4.2.3 Deleting a Part Number.....	15
4.2.4 Run Screen .....	16
4.3 Setup Menu.....	16
4.3.1 Signature Capture .....	16
4.3.2 Signature Learn Parameters .....	17
4.3.3 Machine Interface .....	18
4.3.4 Other Settings .....	19
Appendix A – Configuration Worksheet.....	20
Appendix B – Spare Parts .....	20
Appendix C – Typical Force Signatures of Crimp Defects.....	21
Warranty.....	21

## Section 1

### General Description

#### 1.1 Features

- Accurate discrimination of crimp defects from normal production
- Simple operator function – easy to set up
- Graphics color changes for visual indication of crimp defect
- Audible alarm when defect is found
- Press can be inhibited when defect is found
- USB2.0 interface for PC software
- Password protected set up
- Mounts directly on the TM-3000 and TM-4000 presses
- Not for use on the TM-2000 press

#### 1.2 Technical Specification

##### Environmental:

Operating temperature: 15° to 50°C  
(60° to 120°F)

##### Electrical Input:

85-264VAC, 47-63Hz  
(Adapter output 24VDC  $\pm$ 10% 350mA)

##### Sensor Input:

AC coupled, Inverting or Non-inverting  
(selectable), SMA connector

##### Communication

USB 2.0 (Mini B connector)

##### Inputs and Outputs:

Input 1: 24VDC discrete input  
Output 1: 1A @ 30VDC, 1A @ 240VAC  
Output 2: 1A @ 30VDC, 1A @ 240VAC

##### Dimensions:

Height: 147mm (5.6in)  
Width: 89mm (3.5in)  
Depth: 25mm (1.0in)

#### 1.3 Description

The crimp force monitor measures the force signature of a crimped terminal and compares it to a reference crimp. Depending on the limits programmed, the measurement will pass, fail, or be suspect.

When a measurement is suspect, the display backlight will turn yellow to warn the operator. A failed measurement will cause the backlight to turn red and an audible alarm to sound. The operator must press a button to silence the alarm and reset the monitor. If connected, the crimp force monitor can inhibit the press foot switch when a failure occurs.

The crimp force monitor can be set to display peak force in pound, kilograms, or newton units. A production counter is also included as well as job storage.

## 1.4 Delivery Check

Carefully remove the crimp force monitor from its shipping carton and determine the following items are included in the package.

<u>Decription:</u>	<u>Quantity</u>
Control Module	1
Force Sensor with Ram Mount	1
SMB sensor cable	1
Mini-USB cable	1
DC power supply	1
Foot switch cable	1
Press Mounting kit	1
CD for PC software	1
CD for operating manual	1
Crimp Force Monitor Manual TM-638007950	1
Force View Software Manual TM-638007958	1

## 1.5 Tools

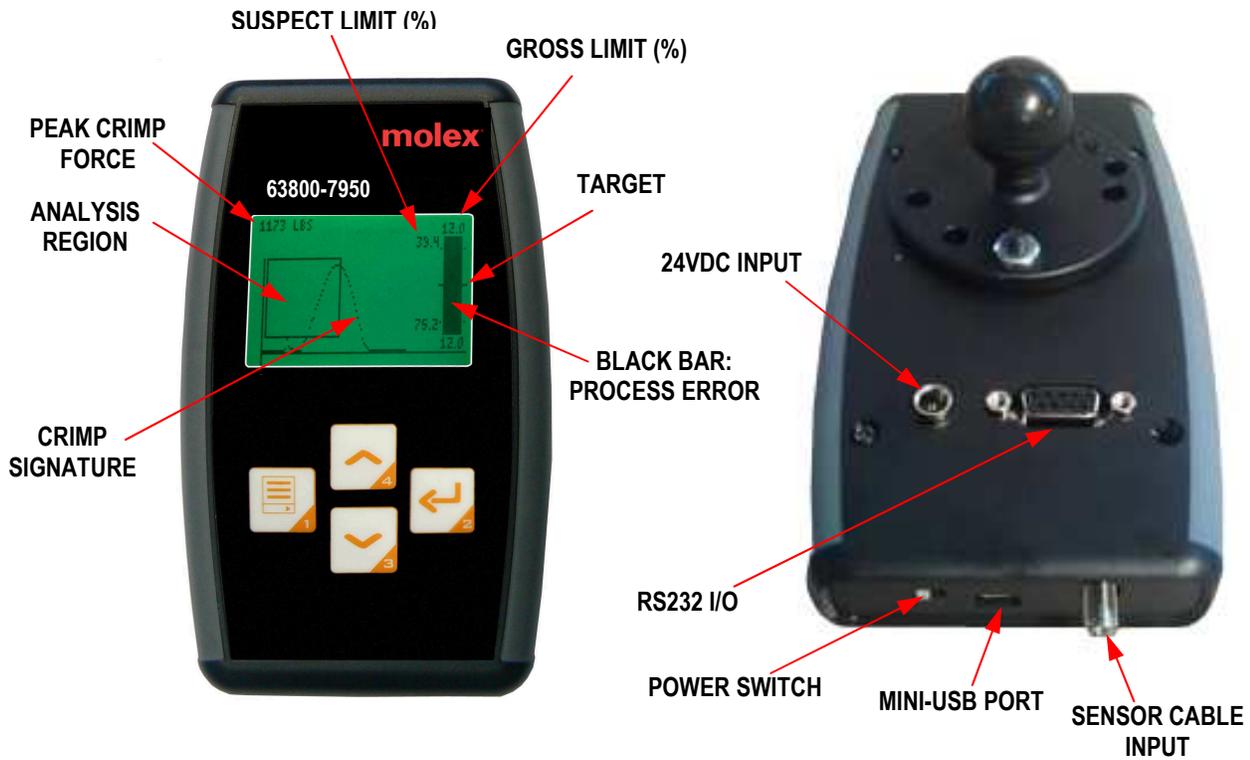
The following tools are recommended for installation of the crimp force monitor:

1. 3mm hex wrench (to install ram sensor)
2. 4mm hex wrench (to install mounting bracket)
3. Adjustable wrench (to install mounting bracket)

## Section 2

### Setup and Installation

#### 2.1 Controls Overview of the Crimp Force Monitor



	<p><b>MENU KEY:</b> Return to previous screen or cancel</p>
	<p><b>DOWN KEY:</b> Move down to next menu item or screen</p>
	<p><b>UP KEY:</b> Move up to next menu item or screen</p>
	<p><b>ENTER KEY:</b> Move to selected screen or select current item</p>

## 2.2 Set-Up



Read the following instructions before attempting to operate the crimp force monitor.

This unit ships from the factory assembled, calibrated, and tested. For best results, users should familiarize themselves with the setup and operation of the unit before placing it in service.

As a load sensing device, the unit should be handled with care. Dropping either the control module or ram sensor assemblies can cause damage to the unit. Applying excessive force to the ram sensor, either by exceeding 10,000 lbs (45kN) during a press crash, or by dropping the sensor assembly, can cause irreparable damage to the sensor.

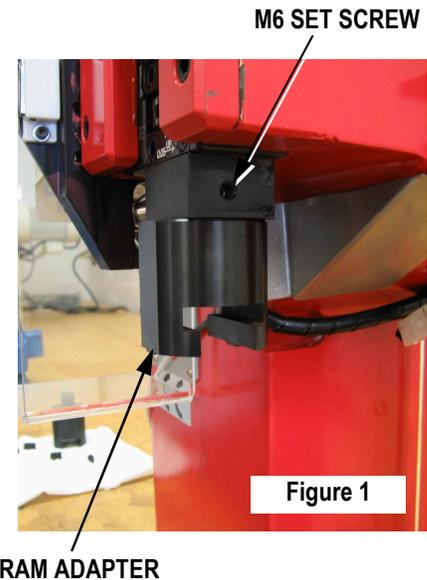
## 2.3 Ram Sensor Installation

The ram adapter in the press must be removed and replaced with the ram sensor furnished with crimp force monitor.



**CAUTION:** Always disconnect power supply before installing or removing tooling.

1. Using a 3mm hex wrench, remove the M6 set screw from the right side of the press ram. There is a second set screw that must be loosened (not removed) to free the ram adapter. See Figure 1.
2. Install the ram sensor with the set screw notch in the shoulder facing the set screw.
3. Tighten the set screw and add the second set screw behind it.



## 2.4 Mounting the Control Module

An adjustable mount is included with the crimp force monitor. This is intended to be mounted to the terminal guide bracket as shown in Figure 2.



Figure 2

## 2.5 Cable Connections

With the control module and ram sensor installed, connect the cables as shown in Figure 3. The sensor cable should be looped behind the press to avoid interfering with the press guard door.



**NOTE:** Use care when connecting the sensor cable. The SMA terminals are fragile and easily damaged.

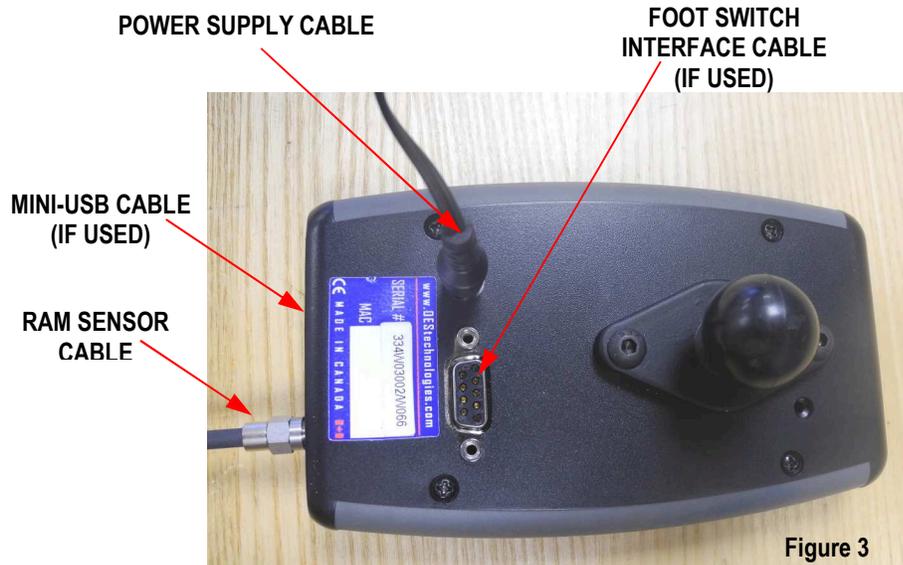


Figure 3

The foot switch interface cable is used if the crimp force monitor is to inhibit the foot switch during a fault. One end of the cable connects to the back of the press, one end connects to the foot switch plug, and the last end connects to the DB9 I/O receptacle on the back of the control module.

The mini-USB cable is used to connect the crimp force monitor to a PC for data logging. See TM-638007958 for installing the ForceView software on a PC.

## 2.6 Power Supply Connection

The power supply accepts a range of input AC voltage and can be changed depending on the AC receptacle available. To change the style of plug, move the tab on the back of the AC adapter in the direction of the arrow and remove the plug. The new plug is installed in the reverse order. See Figure 4.



Figure 4

## Section 3

### Operation

#### 3.1 Learning a Process

1. From the main menu select the **LEARN**  icon.
2. After the press has been set up and the crimp verified, press the  **ENTER** key to start the learn process. The Supervisor password is required (default password is 1111) to learn.



**NOTE: BE SURE THE CRIMP IS VERIFIED. THE CRIMP MONITOR WILL LEARN ITS LIMITS BASED ON THIS CRIMP.**

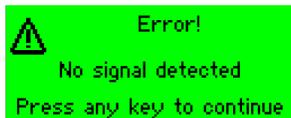
3. The **CFM GAIN** has already been set in the setup configuration. After the first crimp, the internal signal conditioning circuits will be configured and the learning process will begin.
4. The crimp force monitor requires a minimum number of samples (usually 5) set in the configuration and then following successful learn, will automatically change to the **RUN** mode.

#### 3.2 Auto-Gain Feature

At the start of the learning process and following the first press cycle, the crimp force monitor automatically adjusts the force sensor input gain or amplification factor relative to the peak crimp force. Small gauge wire crimping for example, will have a higher gain to optimize the analysis. In some very low crimp force applications, it may not be possible to detect the crimp force signal following the press cycle.

If no signal is detected while in the **GAIN** stage, press the  key to initialize the **Auto-Gain** feature.

1. After crimping a wire, press the  key. 
2. The crimp force monitor will automatically adjust the internal signal conditioning circuits based on this sample crimp and the learning process can continue as normal
3. If no signal is detected during the **Auto-Gain** process, the crimp force monitor will display the following error message.



Please check the sensor and sensor cabling for damage and/or proper installation.

#### 3.3 Information Screen

From the main menu select the information  icon.

**Gain Level** is showing the selected level the unit is using.

**Headroom** is the comparison between the peak force of the reference signature and the peak force of a crimp with no wire (terminal only). Headroom is the amount of crimping force specifically related to the compression of the wire core bundle and is calculated using the following formula:

Peak Force of Reference Signature – Peak Force of Crimp with No Wire

X 100

Peak Force of Reference Signature



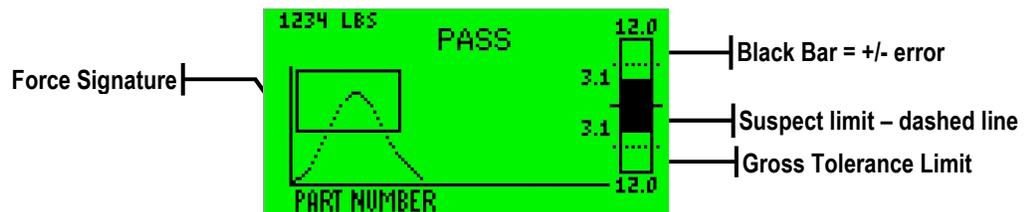
### Performing the Headroom Calculation

The Headroom is automatically calculated after every crimp using the peak force of the last machine cycle and the peak force of the reference signature. Because the headroom calculation is based on the peak force of the reference, signature it is important to ensure the process is properly set-up and learned by the crimp force monitor. When a headroom measurement is required simply, crimp a terminal without a wire.

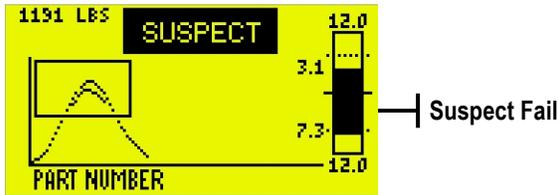
## 3.4 Run Screens

### 3.4.1 Main Screen

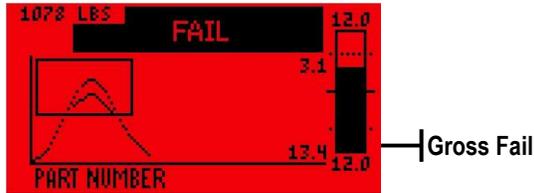
The **Main** screen provides a snapshot signature of the last machine cycle, relative to the learned signature. The box displayed is the analysis region of the crimp force signature. The error bar on the right side of the display indicates both the + and - signature error variation relative to the learned signature. Two levels of failure – “**Suspect**” and “**Gross Fail**” are determined if the + or - error exceeds the limits shown on the bar. The Peak crimp force is displayed in engineering units in the top left corner for reference purpose.



There are two failure modes – **Suspect**, and **Fail with suspect tolerances** indicated by a dashed line and fail tolerances indicated by the outlined box. If the signature error exceeds either the “+” or “-” dashed marker, then a suspect condition is annunciated in Yellow on the screen as shown below.



If the signature error exceeds either the outline box then the fail condition is annunciated in Red on the screen as shown below.



### 3.4.2 Counter Screen

The **Counter Screen** totals the number of “Pass”, “Suspect” and “Fail” parts while automatically calculating the scrap rate.

Pass Count:	79
Suspect Count:	10
Fail Count:	26
Scrap (%):	32 ↵ to Clear

To clear the production counters, press enter while viewing (password may need to be entered depending on settings)

## 3.5 Operator Interaction

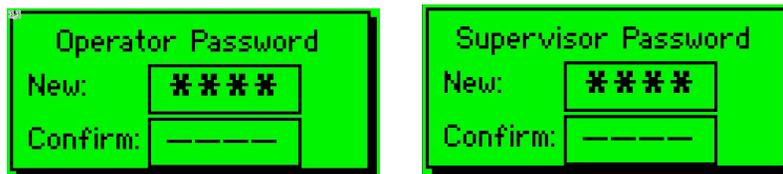
The crimp force monitor includes several special features to help control access and limit uncontrolled adjustment.

### 3.5.1 Password Access

Passwords can be optionally activated to control access to the tolerances and analysis regions and setup menus.

Edit Limits:	Supervisor
Edit Setup:	Operator
Clear Counters:	Operator
Set:	Operator Supervisor

The crimp force monitor utilizes 2 user accounts – “Operator” and “Supervisor”, each of which have a unique 4 number password and access permissions. The monitor is delivered with all access set to Supervisor (password 1111).



The Passwords can be changed at any time by first entering the correct password and then entering the new password.

**Note:** If a password is lost or forgotten, the unit will need to have its software reloaded. Contact Molex if this occurs.

### 3.5.2 Press Inhibit

The crimp force monitor can be programmed to inhibit the press immediately after a bad crimp. This functionality is associated with the operation of the FAIL or SUSPECT output. Several methods are available to reset the machine allowing the operator to continue production. With the reset method set to *Keypad*, the operator will be required to press a button on the keypad continue. Alternatively, if more control is required, the INPUT option requires that the digital input to be activated before production can continue. This option allows for external devices such as a key switch.



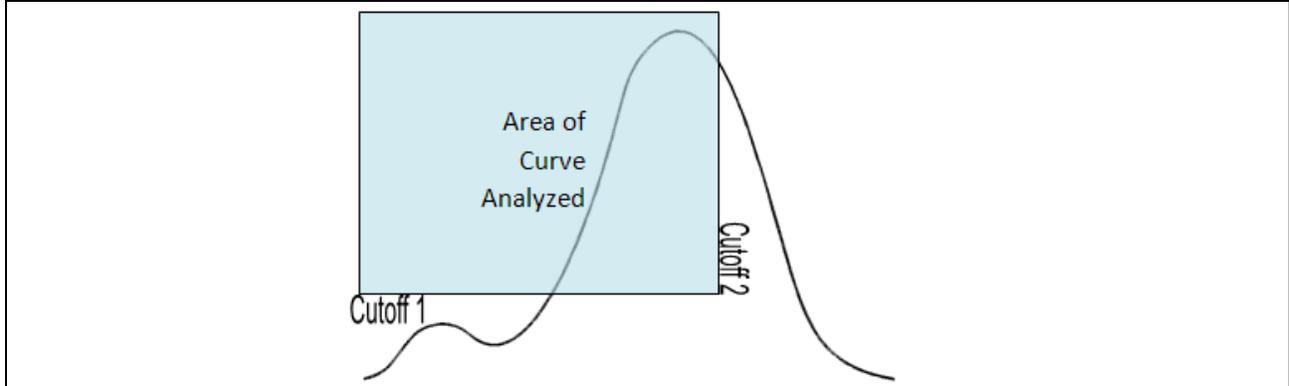
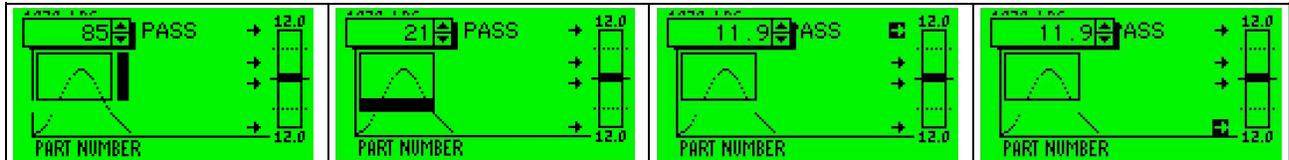
If the foot switch cable is connected to the crimp force monitor, the foot switch will be disabled when a fail occurs. Pressing a keypad button will silence the alarm and re-enable the foot switch.

## Section 4

### Process Setup

#### 4.1 Signature Analysis and Tolerances

The region of the force signature analyzed is represented by the box as shown below. This region can be adjusted from the RUN screen by pressing the  key. If a password is enabled you will be required to enter it before proceeding. Use the  or  keys to select the desired setting to adjust.



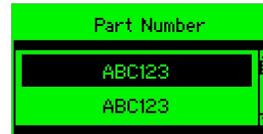
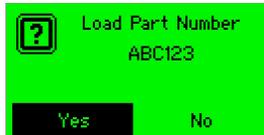
<b>Cutoff 1(%)</b>	Determines the lower limit of the analysis region and is adjustable from 0% (bottom of curve) to 100% (peak of curve)
<b>Cutoff 2(%)</b>	Defines the right side limit of the analysis region and is adjustable from 0% (start of curve) to 100% (end of curve)
<b>FAIL [+]</b>	Fail tolerance for positive variation
<b>FAIL [-]</b>	Fail tolerance for negative variation
<b>SUSPECT(+)</b>	Suspect tolerance for positive variation inside the FAIL + tolerance
<b>SUSPECT (-)</b>	Suspect tolerance for negative variation inside the FAIL - tolerance

#### 4.2 Part Number Database

The part number database allows up to 50 different parameter configurations to be stored in the crimp force monitor's internal memory. Each parameter configuration or Part Number can be individually named with up to 15 letters or numbers. During production, the operator selects the part number to be produced from the screen menu and the specific parameters for the application are automatically loaded. Additionally the crimp force monitor will automatically proceed to the learn screen simplifying the changeover. Once the machine has been set-up and verified production can immediately begin.

### 4.2.1 Loading a Part Number

1. From the main menu, select the part number database  icon.
2. Scroll through the part number list with the  and  keys.
3. Press the  button to select the highlighted part number.
4. Confirm the selection.



5. The crimp force monitor will automatically load the stored parameters and proceed to the learn screen.
6. After the machine has been set-up and verified press  to start the learn process.

### 4.2.2 Creating a New Part Number

1. From the main menu, select the  icon.
2. Select *Create New Part Number* in the *Part Number Database* tab.



#### Configuration Parameters Stored in a New Part Number

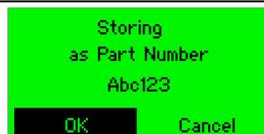
The CFM will save the current configuration parameters under the entered name. The parameters from the Signature Capture, Signature Analysis, Gross Tolerances and Learn Parameters are stored in the part number database. Please refer to Appendix A for more information on the parameters stored for each mode of operation.

3. Enter a name for the new part number using the keypad.

	Forward: Move the cursor to the next character
	Down: Scroll down through available characters
	Up: Scroll up through available characters
	Enter: Finished entering Part Number name

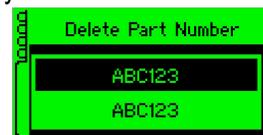


4. Confirm the selection.

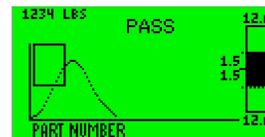


### 4.2.3 Deleting a Part Number

1. From the main menu, select the  icon.
2. Select *Delete Part Number* in the *Part Number Database* tab.
3. Scroll through the part number list with the  and  keys.
4. Press the  button to delete the highlighted part number.
5. Confirm the selection.



### 4.2.4 Run Screen



The part number selected is displayed at the bottom of the run screen only. When this part number appears, the part number shown has gone through the learn procedure and is currently running with all the correct parameters intact. If any of the parameters of this part number are changed. The part number will disappear. This is a very useful tool for set-up, maintenance and production schedulers to confirm that each machine is using the approved set-up when running specific part numbers.

## 4.3 Setup Menu

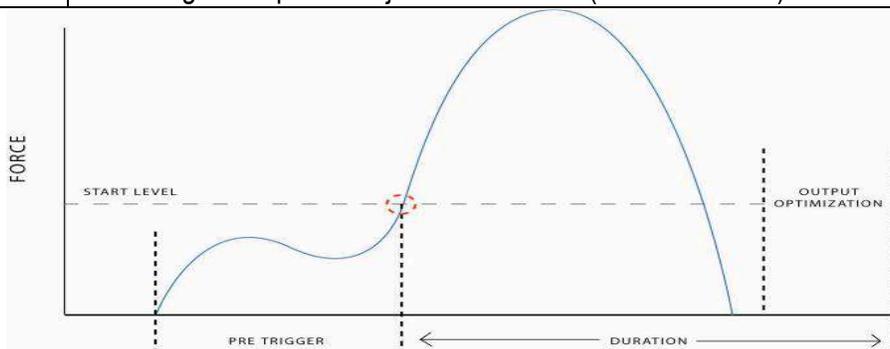


To access the Setup configuration press the  key.

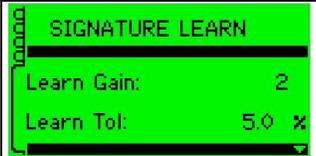
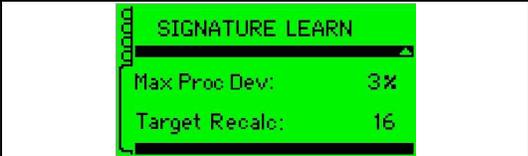
### 4.3.1 Signature Capture

<b>SIGNATURE CAPTURE</b> Mode: AUTO Start Level: 10 %	<b>SIGNATURE CAPTURE</b> Pre-Trig (ms): 10 Duration (ms): 40	<b>SIGNATURE CAPTURE</b> Filter (ms): 5 Scale: 5000	<b>SIGNATURE CAPTURE</b> Units: LBS Polarity: Inverting	<b>SIGNATURE CAPTURE</b> Alignment: Falling Height: 75 %
---	--	---	---	--

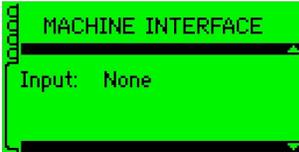
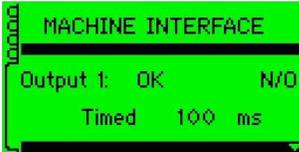
<b>Mode</b>	Capture Mode AUTO – utilize internal auto trigger EXT – utilize internal auto trigger along with digital input (not used)
<b>Start Level (%)</b>	Defines the trigger point for data capture. For example, a Start Level of 5% and a force sensor with a full-scale value of 2500lbs would have a trigger point set at 125lbs.
<b>Pre-Trig (ms)</b>	Amount of time that data is captured prior to the trigger point.
<b>Duration (ms)</b>	Amount of time that data is captured after the trigger point. The CFM will automatically shorten the duration time to an optimal value if applicable.
<b>Filter</b>	Sensor input must remain above the start level for the defined time before data capture will begin. The filter option is often used to eliminate false triggers that are caused by mechanical noise during a press cycle.
<b>Scale</b>	Full scale output of the ram force sensor
<b>Units</b>	The desired displayed units of measure (pounds, Newtons, kilograms)
<b>Polarity</b>	<u>INVERTING</u> : Used with ram-mounted force sensor. <u>NON INVERTING</u> : Not used with the crimp force monitor.
<b>Alignment</b>	Area of the curve where the reference and production curves will be overlapped. Alignment can be set to the peak of the curve or a point on either the rising or falling edge of the curve. Falling alignment will give the best results.
<b>Height</b>	Determines the exact point on either the Rising or Falling edge of the curve to be used as the alignment point. Adjustable from 0% (bottom of curve) to 100% (peak of curve).



### 4.3.2 Signature Learn Parameters

		
<p><b>Learn Gain</b></p>	<p>At the start of the learning process, the crimp force monitor uses the GAIN setting configured in the Learn Gain parameter. For certain low force crimping applications where more sensor signal amplification is required, the GAIN can be increased to achieve more signal amplification to ensure the force signal is detected by the crimp force monitor.</p>	
<p><b>Learn Tolerance (%)</b></p>	<p>During the learn process, signatures are captured and compared prior to the calculation of the reference or learn curve. The learn tolerance is the maximum allowable variation between the individual signatures. If during the learn procedure the signature exceeds the learn tolerance when compared to the other learn signatures, it will be excluded from the calculation of the reference target curve.</p>	
<p><b>Min. Samples</b></p>	<p>Minimum number of signatures required to establish the reference or learn curve. Each signature must not vary from the other signatures by more than the <i>Learn Tolerance</i>. In Learn mode, the first press cycle determines the gain level, and is in addition to the minimum number of cycles required to complete the learn process.</p>	
<p><b>Max. Samples</b></p>	<p>Maximum number of machine cycles permissible to learn a process. If the crimp force monitor does not learn a process after the maximum press cycle limit is reached, then the learn process has failed and will be restarted.</p>	
<p><b>Max. Proc Dev</b></p>	<p>The crimp force monitor utilizes a variety of methods to continually monitor the current state of the process and adjust the reference force signature accordingly. These adjustments allow the crimp force monitor to accommodate normal variations such as terminal stock thickness changes or minor tooling wear.</p> <p>The adjusted reference curve is compared to the reference curve established by the learn Process at the start of production and should it vary by more than the allowable limit as defined by the Maximum Process Deviation parameter the crimp force monitor will immediately stop production. This ensures that the adjusted reference curve remains within an allowable range from the initial reference curve calculated by the learn process.</p> <div data-bbox="857 1499 1135 1654" data-label="Image">  </div>	
<p><b>Target Recalc</b></p>	<p>Rate at which the crimp force monitor performs adjustments to the reference curve, selectable from 2 to 64 good pieces</p>	

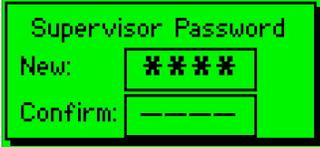
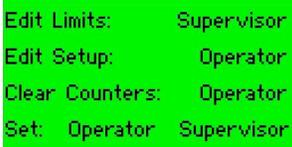
### 4.3.3 Machine Interface

		
<p style="text-align: center;"><b>Input</b></p>	<p>Input functionality can be assigned to 1 of 4 options.</p> <p><u>None</u> – Input is not used. This is the default setting of the crimp force monitor.</p> <p><u>External Trigger</u> – The signature capture will only commence after the Input is Activated and sensor input trigger level reached. Not used.</p> <p><u>Activate Learn</u> – Learn is activated by input. Not used.</p> <p><u>Reset Fail</u> – Crimp Fail condition reset by input. Not used.</p>	
<p style="text-align: center;"><b>Output 1 and 2</b></p>	<p>Output functionality can be assigned to 1 of 4 options</p> <p><u>None</u> – output is not used.</p> <p><u>OK</u> – output active after good part with configurable duration</p> <p><u>Suspect</u> – output active after suspect part.</p> <p><u>Fail</u> – output active after fail part.</p> <p><b>This option must be selected if the foot switch interface cable is used.</b></p> <p>For both Suspect and Fail output there are 3 output reset options available:</p> <p><u>Timed</u> – the output will turn ON for the time duration selected in milliseconds. Not used.</p> <p><u>Keypad</u> – the output will be reset by pressing any key. Default setting.</p> <p><u>Input</u>- the output will be reset following a digital input is activated. Not used.</p>	

#### Empty Crimp Without Internal Trigger

It is possible for the crimp force monitor to not detect the failure when an empty crimp is made. When an empty crimp is made, the crimping force will be very low. If the crimping force is less than the trigger point, the trigger conditions will not be satisfied and the crimp force monitor will not acknowledge that a crimp has been made. In this case, the crimp force monitor will still display the crimp status for the last piece potentially causing confusion for the operator.

### 4.3.4 Other Settings

		
<p><b>Set Defaults</b></p>	<p>Restores all of the Setup parameters to the factory settings          – See Appendix A for factory settings</p>	
<p><b>Password Setup</b></p>	<p>The crimp force monitor provides support for two distinct user accounts. The user accounts are called <i>Operator</i> and <i>Supervisor</i>, to closely match the types of users typically working with the crimp force monitor. The permissions and password of each user account can be edited by the password holder.</p> <p>The unit is shipped with the Supervisors password set to “1111”.</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="521 730 841 877">  </div> <div data-bbox="857 730 1149 877">  </div> </div> <p><i>Edit Limits:</i> Access to adjust the tolerances and analysis region is controlled by the assigned password.</p> <p><i>Edit Setup:</i> Access to the setup menu is controlled by the assigned password.</p> <p><i>Change Password:</i> Change the password (English, Spanish, or Chinese) for the selected user account.</p> <p><b>Note:</b> If a password is lost or forgotten, the unit will need to have its software reloaded. Contact Molex if this occurs.</p>	
<p><b>Language</b></p>	<p>Selects the displayed language.</p>	
<p><b>Edit Contrast</b></p>	<p>Adjusts the LCD screen contrast</p>	
<p><b>I/O Data</b></p>	<p>Shows the real time status of the input, both outputs and force sensor input for diagnostic purposes.</p>	
<p><b>Service</b></p>	<p>This screen totals the number of cycles of the crimp force monitor at different percentage ranges of the sensors maximum range</p> <div style="text-align: right;">  </div>	

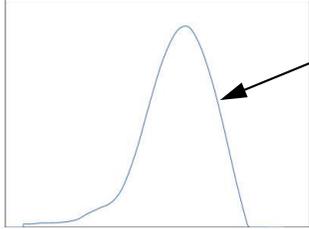
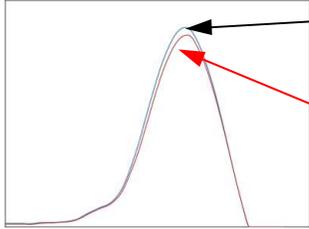
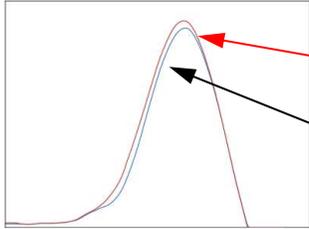
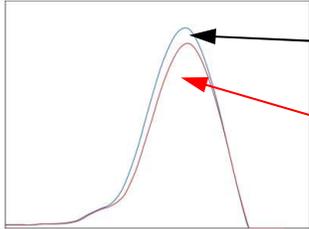
## Appendix A – Configuration Worksheet

<i>Parameter</i>	<i>Default Setting</i>	<i>Custom Setting</i>
<b><i>Signature Capture</i></b>		
Scale	2500	
Units	LBS	
Trigger	AUTO	
Trigger Start (%)	10	
Pre-Trig (ms)	10	
Duration (ms)	200	
Polarity	Inverting	
Filter	5	
<b><i>Signature Analysis</i></b>		
Cutoff 1 (%)	15	
Cutoff 2 (%)	70	
<i>Gross Tolerances</i>		
FAIL[ + ]	12	
FAIL[ - ]	12	
SUSPECT [ + ]	10	
SUSPECT [ - ]	10	
<b><i>Signature Learn Parameters</i></b>		
Learn Gain	2	
Learn Tol (%)	5.0	
Min Samples	5	
Max Samples	16	
<b><i>Machine Interface</i></b>		
Output 1	Fail / NC / Keypad	
Output 2	None	
Input	None	

## Appendix B – Spare Parts

<b>Molex Part Number</b>	<b>Description</b>
<b>638007951</b>	Control Module For 638007950
<b>638007952</b>	Force Sensor, Ram Mounted
<b>638007953</b>	Sensor Cable
<b>638007954</b>	USB Cable
<b>638007955</b>	DC Power Supply
<b>638007956</b>	Foot Switch Cable
<b>638007957</b>	Press Mounting Kit

## Appendix C – Typical Force Signatures of Crimp Defects

 <p><b>Good Crimp</b></p>	 <p>REFERENCE CURVE</p>
 <p><b>Strand(s) Out</b></p>	 <p>REFERENCE CURVE</p> <p>BAD CRIMP</p>
 <p><b>Insulation in Conductor Grip</b></p>	 <p>BAD CRIMP</p> <p>REFERENCE CURVE</p>
 <p><b>No Conductor Brush</b></p>	 <p>REFERENCE CURVE</p> <p>BAD CRIMP</p>

### Warranty

Molex warrants its products to the original purchaser to be free from defects in workmanship and material under normal use and proper maintenance for two years from original purchase. This warranty shall not be effective if the product has been subject to overload, shock load, misuse, negligence, accident, or repairs attempted by others than Molex.

During the warranty period, we will, at our option, either repair or replace defective products. Please call our customer service department for a return authorization number and return the defective product to us with freight prepaid.

The foregoing warranty constitutes the SOLE AND EXCLUSIVE WARRANTY, and we hereby disclaim all other warranties, express, statutory or implied, applicable to the products and/or software, including but not limited to all implied warranties of merchantability, fitness, non-infringement, results, accuracy, security and freedom from computer virus. In no event shall Molex be liable for any incidental, consequential or punitive damages in connection with the use of its products and/or software.

Visit our Web site at <http://www.molex.com>