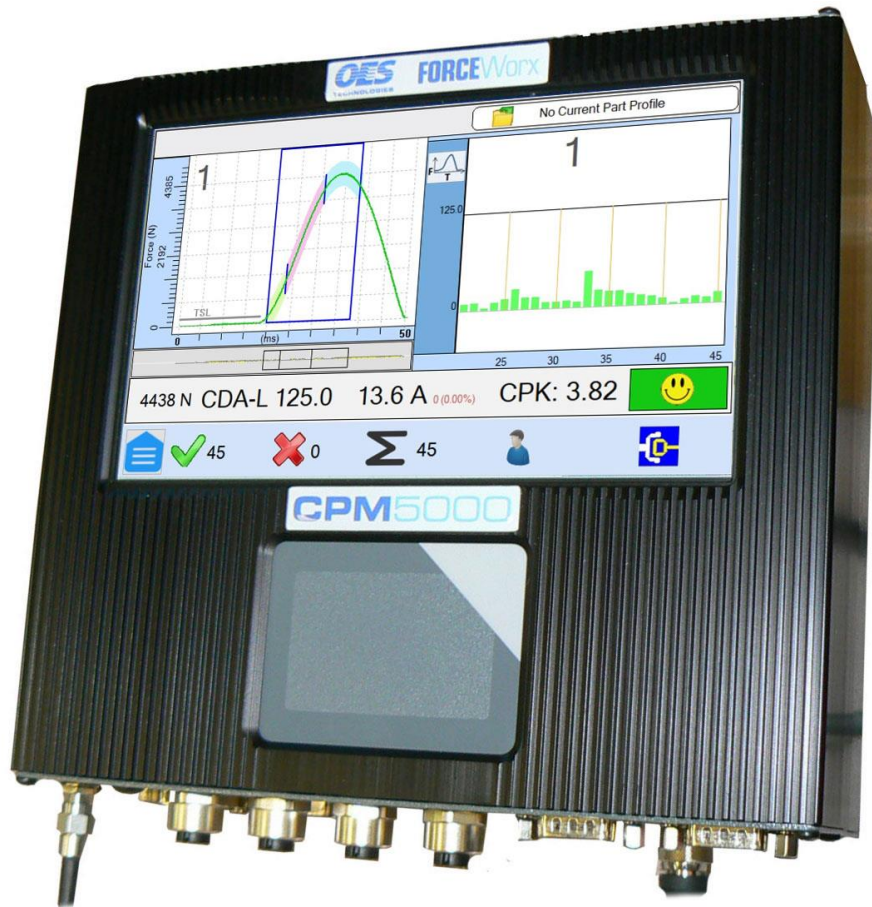


# OES

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## TECHNOLOGIES



## CPM5000

### Crimp Process Variation Monitor

### User Manual



FM 64157

Revision 1.8 – Feb 2021



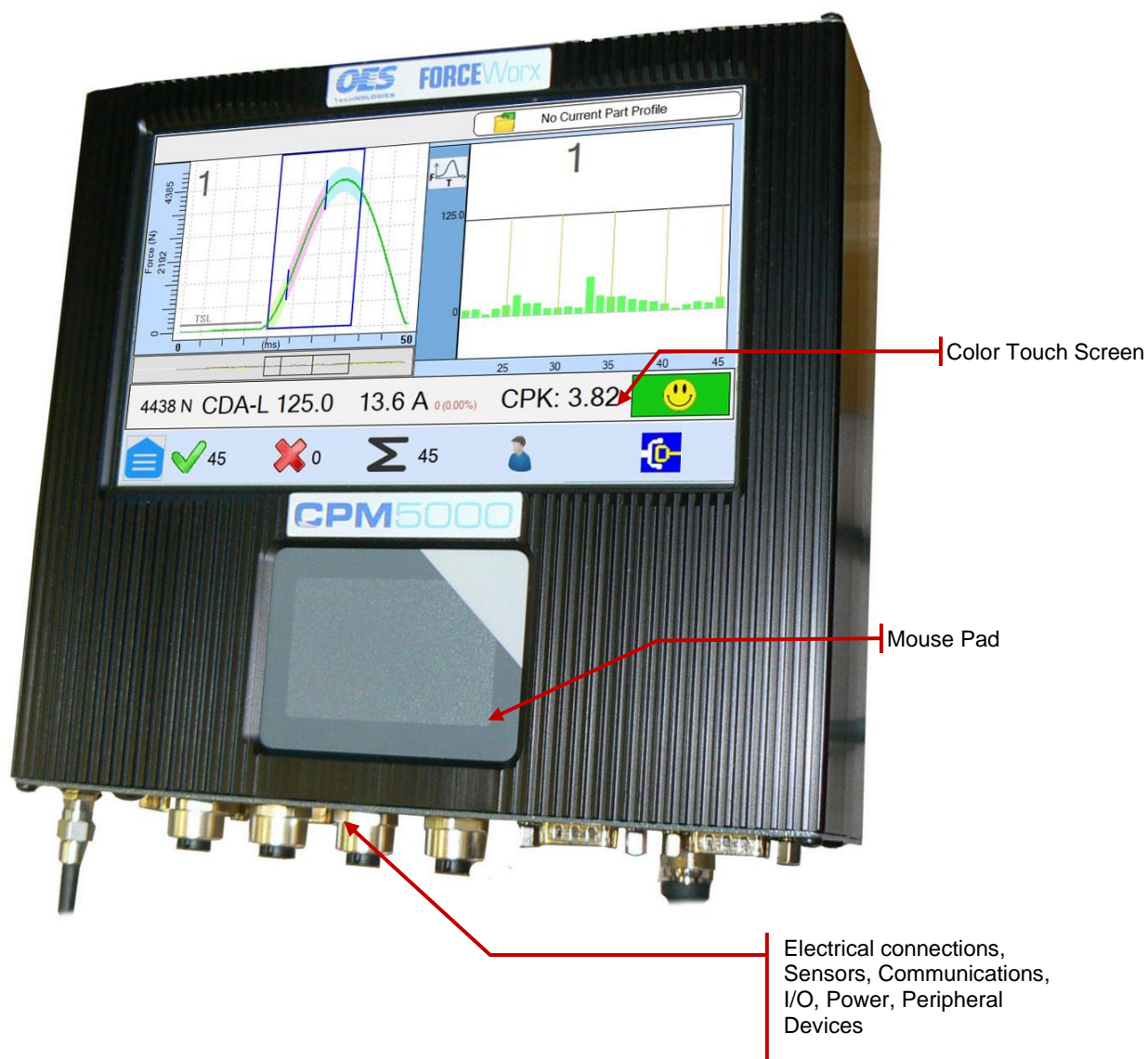
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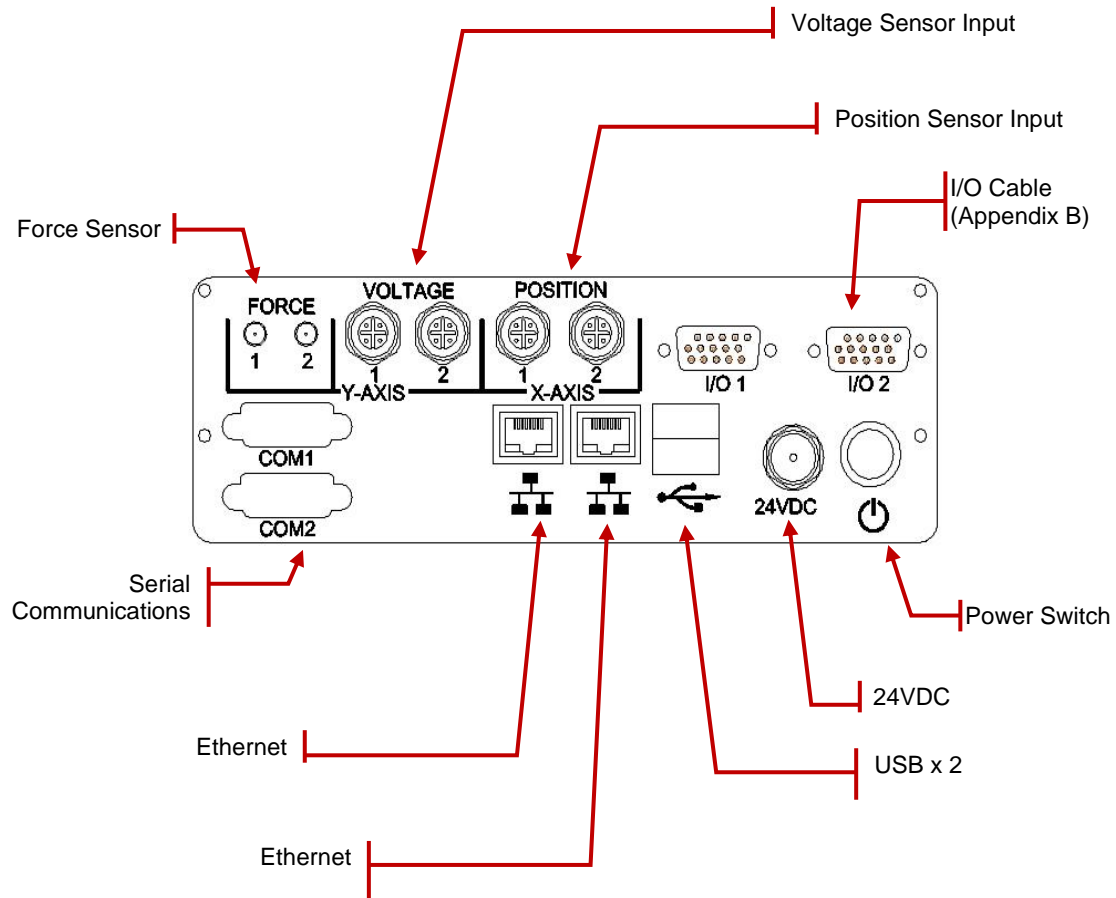
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## 1.0 – Overview of the Crimp Monitor

### 1.1 CPM5000



## 1.2 CPM5000 Connections



## 1.3 CPM5000 Power Supply Wiring



The CPM5000 **SHOULD NOT** be powered off by operational function of the Crimping Press or Automatic Machine.

## 1.4 CPM5000 Feature and Function

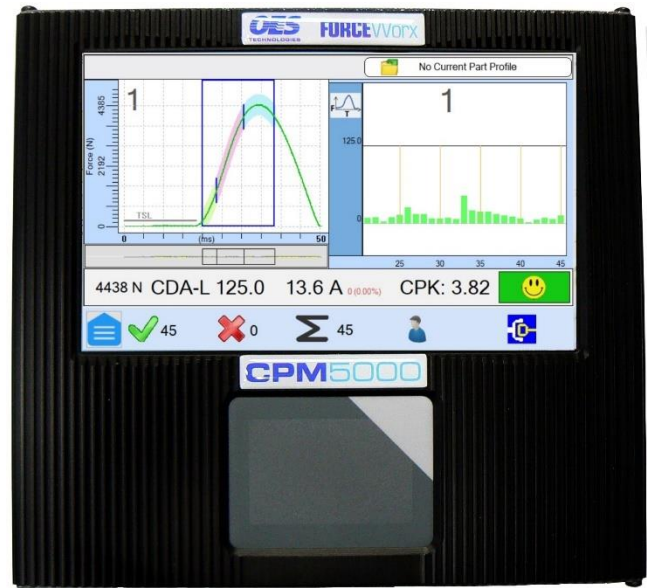
CPM5000 captures and analyzes the crimp force signature from every wire terminal crimp produced for determination of crimp quality. Crimp defects such as missing strands and high insulation are effectively detected by the CPM5000 using OES's patented CDA analysis methodology. Standard configuration settings are used for a wide range of terminal and wire combinations. The CPM5000 is electrically connected to the press or machine for control of the equipment in the event of a crimp defect. CPM5000 will interface directly with OES Wire Chop for control of defective crimps by chopping the wire short immediately following crimp defect detection.

The CPM5000 is compatible with OES's series of piezo force and strain sensors for a wide range of crimp presses.

CPM5000 is supplied as a one or two channel (model CPM5100 or CPM5200) for installation onto both bench top crimping presses and automatic machines.

The CPM5000 combines high performance and user friendliness, which is further optimized with the **"Quality Production Management" (QPM Network System)** option further referred to as **QPM**. QPM adds additional features to the CPM5000 for automating and error proofing the machine setup process. QPM supports the process of machine setup by ensuring correct material is loaded on the machine and confirming crimp dimension during first piece setup prior to machine release to production, while simplifying the operator's role. CPM5000 will interface with a wide range of devices including bar code readers, pull testers, micrometers, and bar code label printers as part of the QPM Network system.

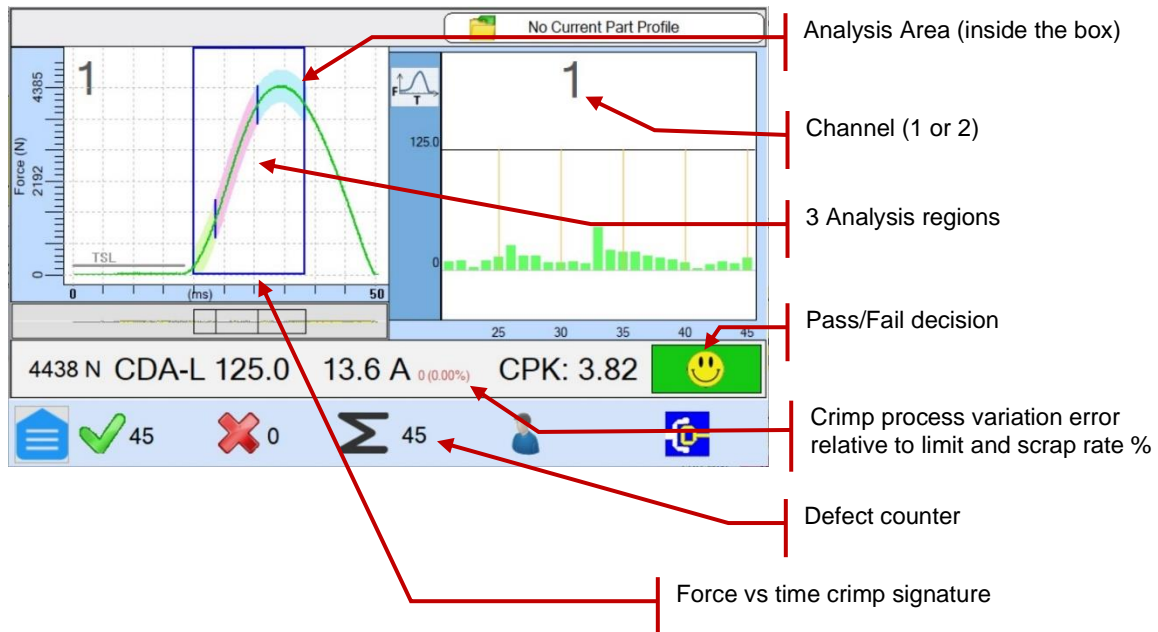
Traceability is a key feature of the CPM5000 having capacity to store up to 2 years of data by part number with date and time stamp. The crimp data log files can be exported or recalled and replayed on the CPM5000 or desktop Log Viewer.





## 1.5 Production Screens

The production screen displays the crimp signature following each crimp cycle with a PASS/FAIL indicator.

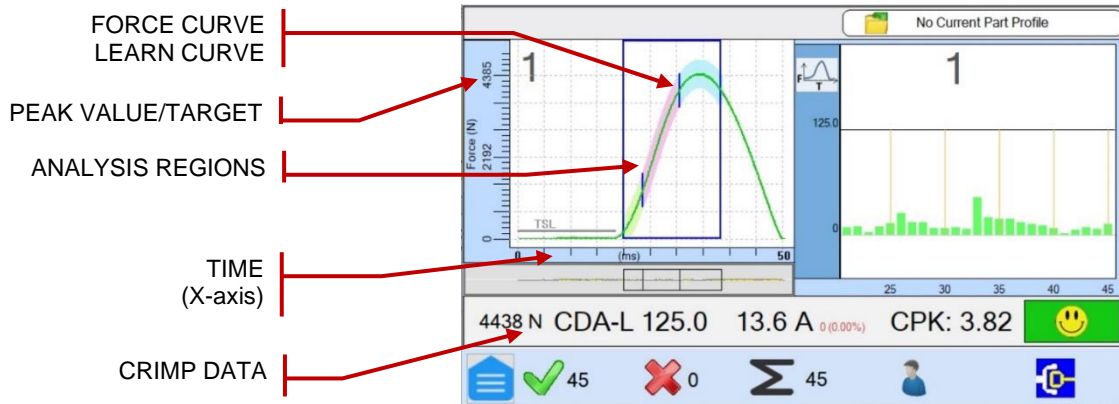


The CPM5000 captures and analyzes the crimp force signature from all production crimps. The crimp signature from each production cycle is compared to the learned reference signature for detection of process variation error. OES's Cumulative Deviation Analysis (CDA) computes the process variation error relative to the reference signature. Three regions of the crimp force signature (R1, R2, & R3) are analyzed for process variation error relative to a tolerance limit for discrimination of good or defective crimp.

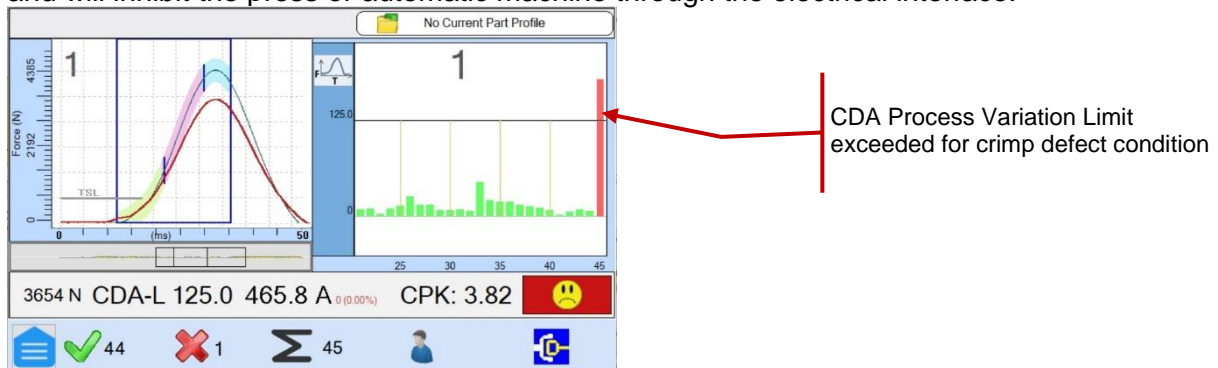
The SPC Trend on the right side of the screen represents the total crimp process variation error relative to the CDA tolerance limit (CDA-L). The CDA-L has a default setting of 125 that is the optimum setting for discriminating between good and defective crimps.

The CPM5000 provides a detailed view of the crimp signature and the trend of the process error relative to the CDA limit for the previous 25 crimps.

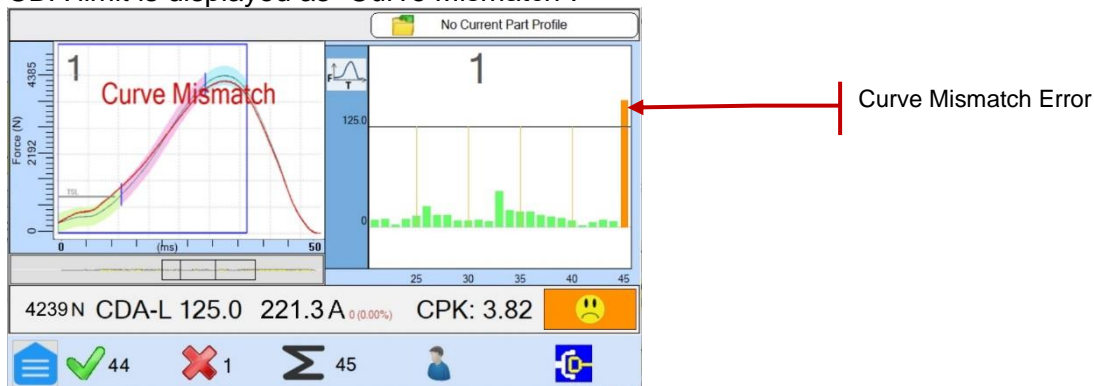




If the computed crimp process variation error exceeds the CDA limit, this is considered to be a crimp defect. The crimp defect condition is displayed on the production screen as shown and will inhibit the press or automatic machine through the electrical interface.

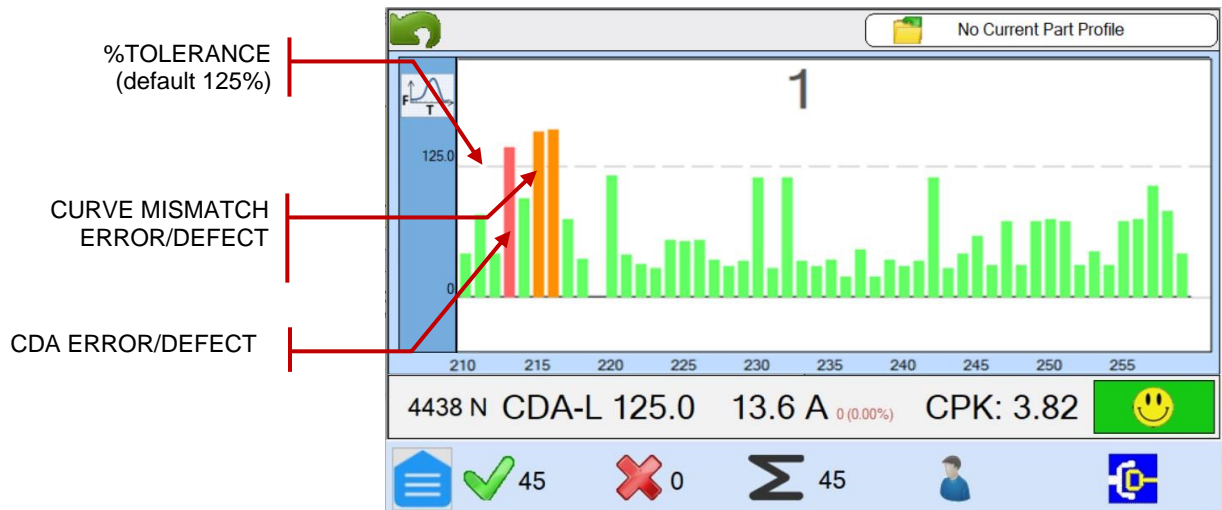


The CPM5000 also monitors for a characteristic change in the force signature, which can be the result of defects such as high insulation. This signature shape change that exceeds the CDA limit is displayed as “Curve Mismatch”.

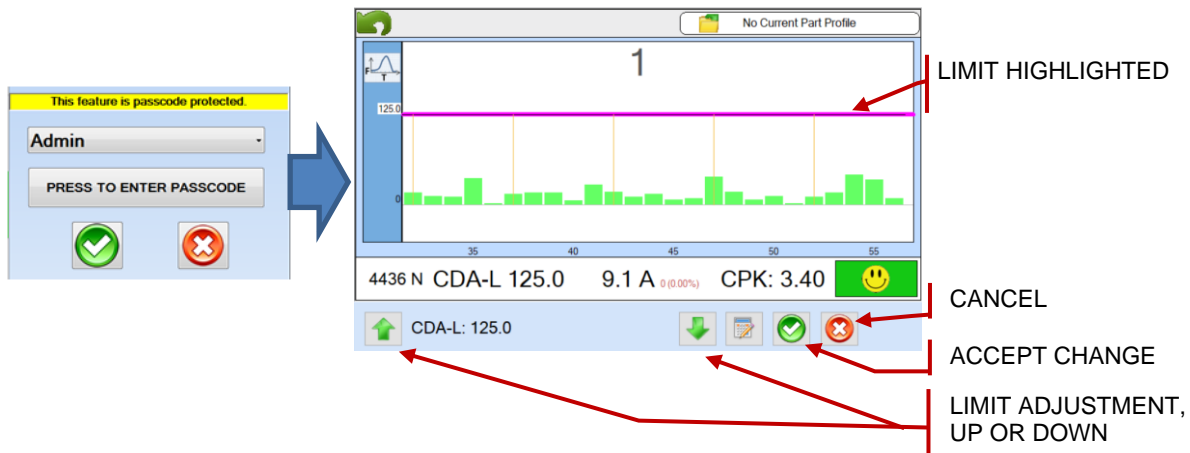


The Curve Mismatch is confirmed on the operator display. The crimp process variation error is displayed in orange.

The trend screen displays the crimp process variation error for the last 25 crimps. Touch the trend screen to expand the view as shown below, displaying the last 50 crimps. Each vertical bar represents the process variation error of each crimp. Colours are as follows.  
GREEN represents a crimp that is within the tolerance limit.  
RED represents excessive crimp variation (CDA Limit exceeded).  
ORANGE represents excessive crimp variation (CMM Limit exceeded).  
YELLOW represent a learn sample.

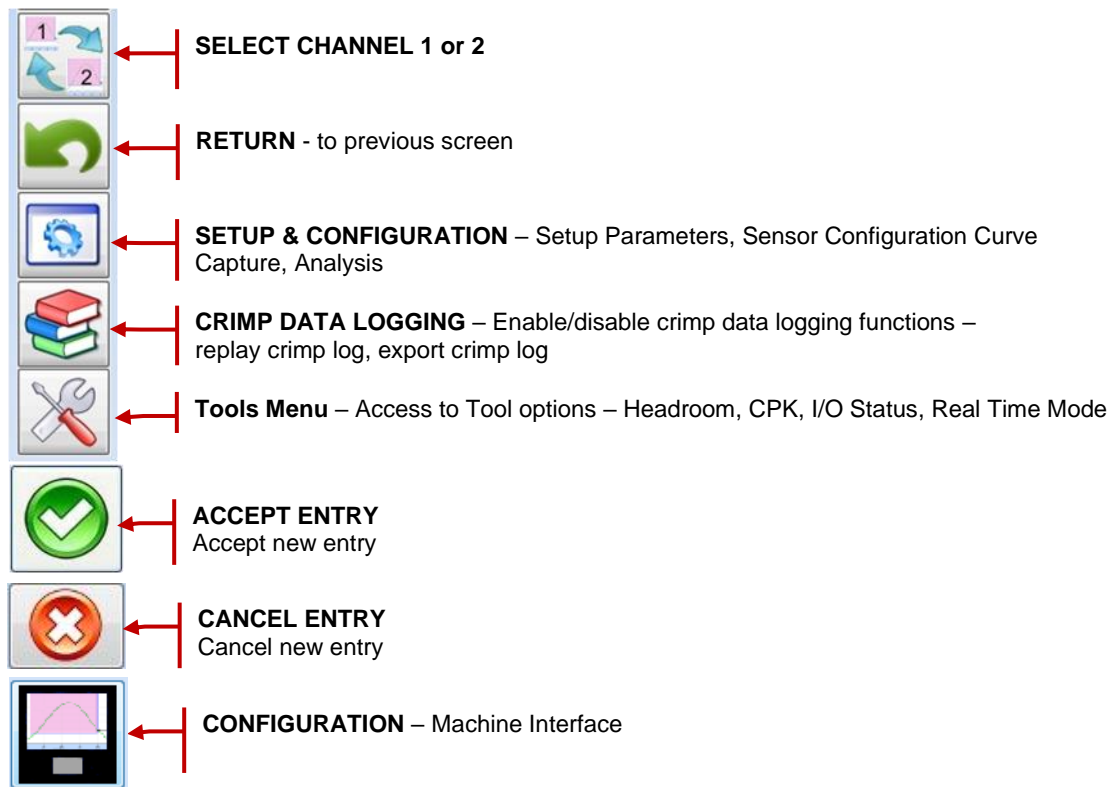


The CDA tolerance limit can be adjusted from the Trend screen by double tapping the tolerance bar, which will prompt for password entry. Following successful password entry, the tolerance will change color to purple and adjustment buttons appear at bottom of the screen to adjust the tolerance limit relative to the process variation error of the last 50 crimp samples.

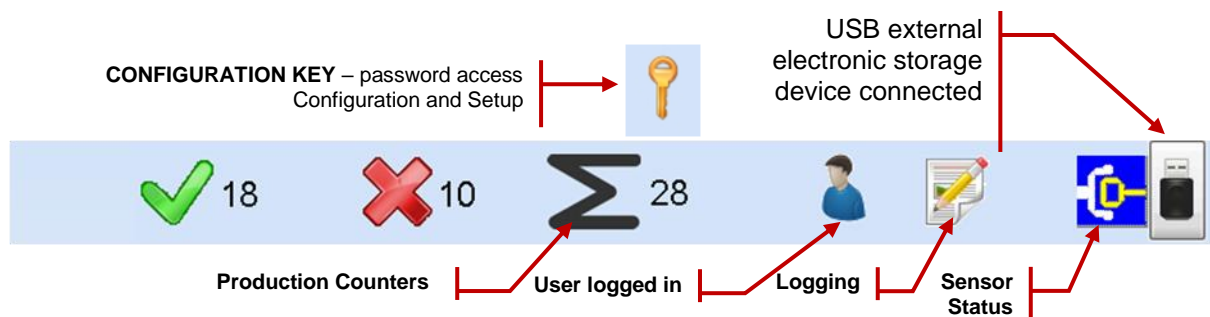


## 1.6 Menu Options

The Icon functions are defined as follows:



## 1.7 Menu Information & Status Indicators



**COUNTER** – Pass/Fail/Total counters.

The **USER** – The user is displayed following log in. Each user can have pre-configured access control (example access to learn, clear counters, configuration routines, etc.).

**LOGGING** status icon displayed during crimp data logging.

The **SENSOR STATUS** indicates the sensor is connected or disconnected.



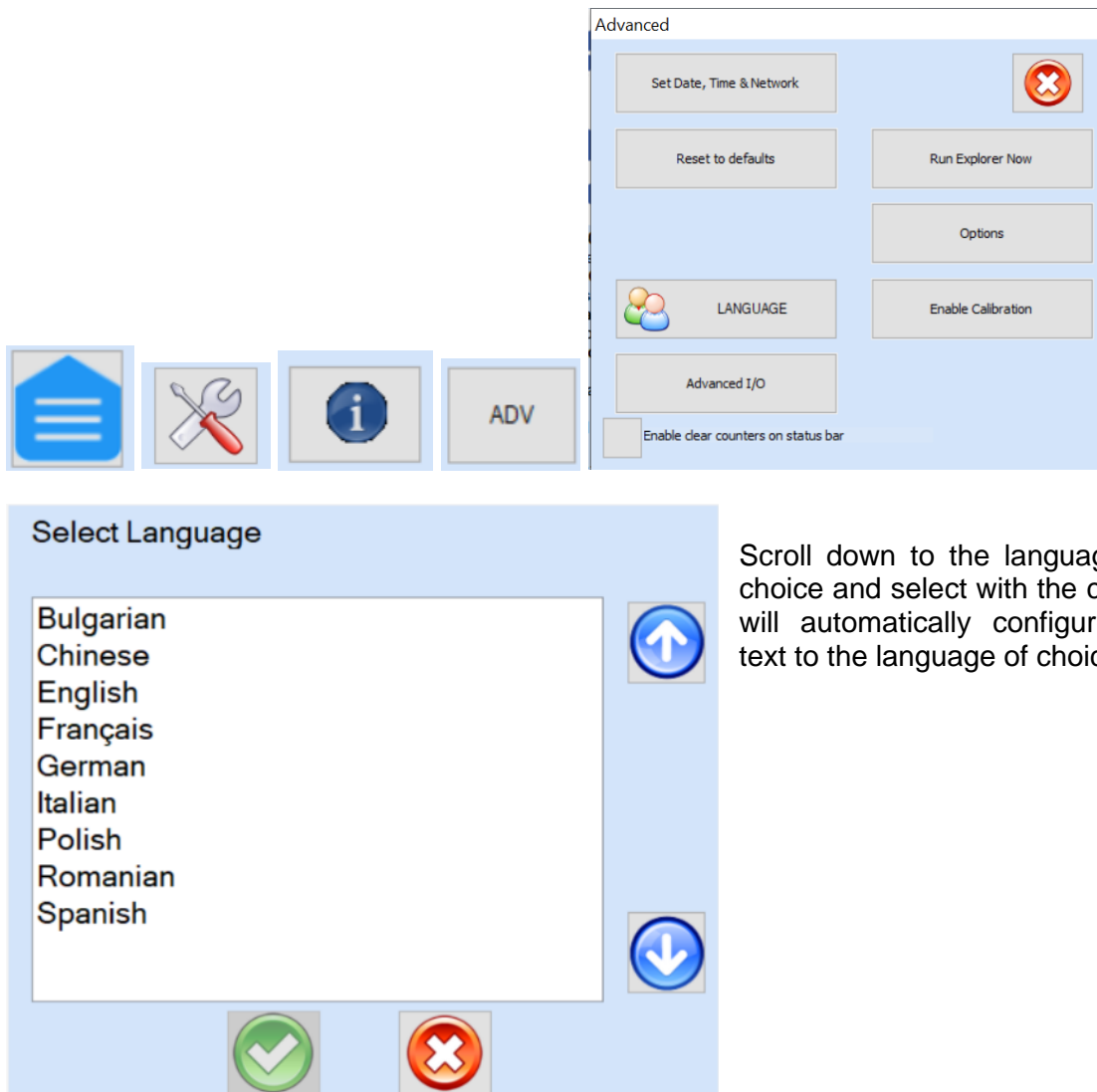
Blue for sensor connected



Red for sensor disconnected.

## 2.0 – Configuration

### 2.1 Language Options





## 2.2 New Installation

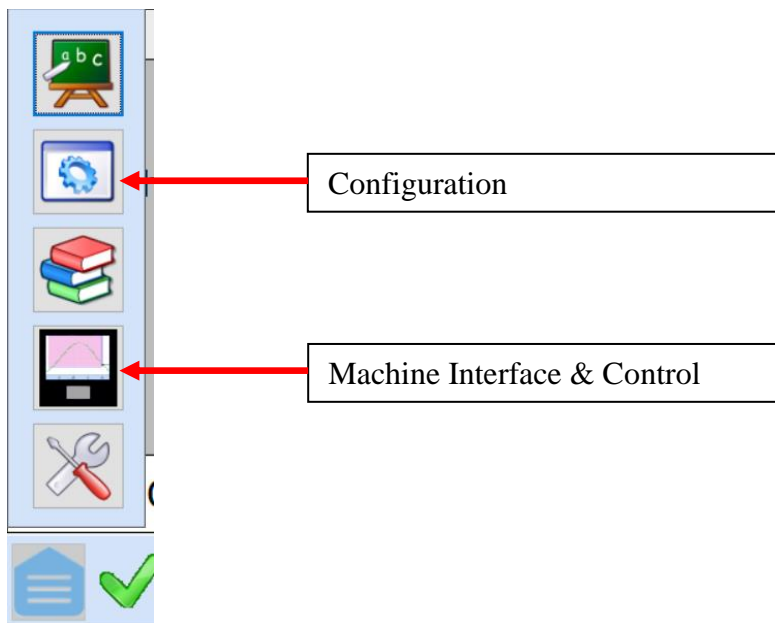
The CPM5000 is designed for installation onto a wide range of presses and automatic machines. It is assumed that the CPM5000 has been installed, supplied with power, and the appropriate sensor is installed and connected by sensor cable to the CPM5000 sensor input.

The following steps are recommended for successful configuration of the CPM5000:


- Step 1 - Sensor Configuration
- Step 2 - Force Signature Capture
- Step 3 - Force Signature Analysis
- Step 4 - Machine Interface & Control

To access the configuration routines the user will first need to enter a correct password either

by logging in with the  or the  .



## 2.3 Password Access

Password entry  is required to access configuration routines. By default, the user “Admin” has all privileges, and the password is blank.

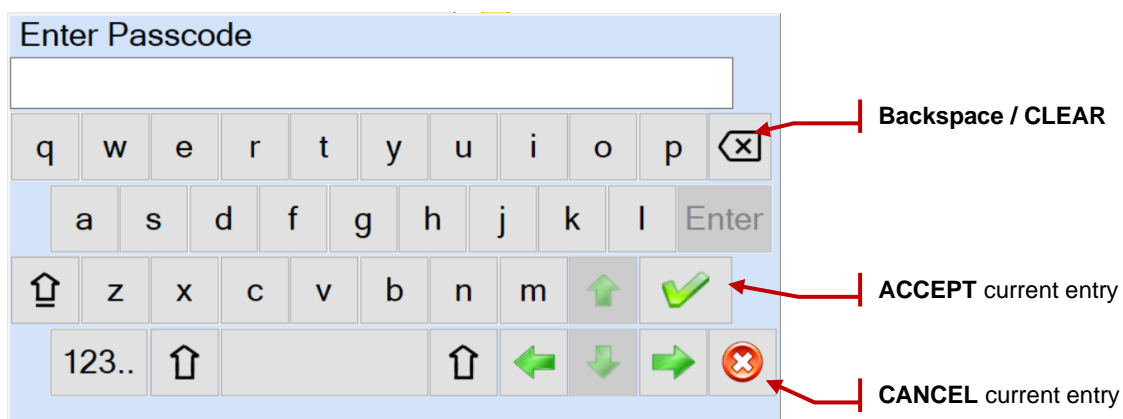


This feature is passcode protected.


Admin

PRESS TO ENTER PASSCODE


A soft keypad supports entry of password.







Enter Passcode

q w e r t y u i o p 

a s d f g h j k l Enter

↑ z x c v b n m ↑ 

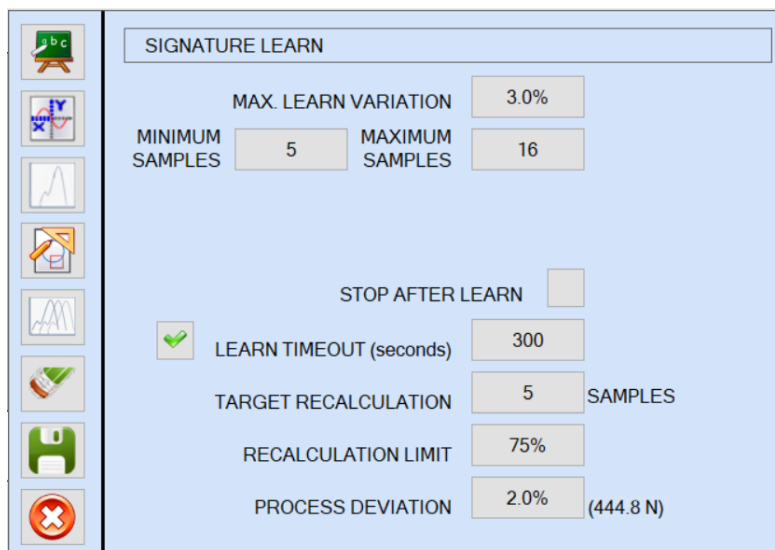
123.. ↑    

Backspace / CLEAR

ACCEPT current entry

CANCEL current entry

Following successful password entry, the Configuration menu options are displayed and accessible.

SIGNATURE LEARN

MAX. LEARN VARIATION 3.0%

MINIMUM SAMPLES 5 MAXIMUM SAMPLES 16

STOP AFTER LEARN ☐

☒ LEARN TIMEOUT (seconds) 300

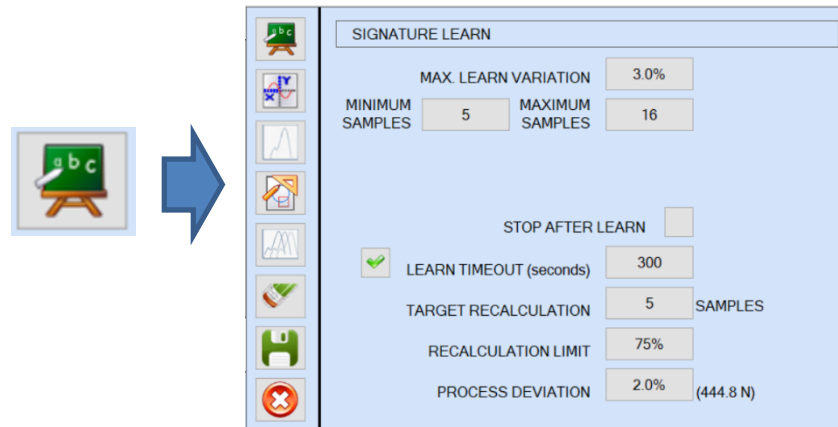
TARGET RECALCULATION 5 SAMPLES

RECALCULATION LIMIT 75%

PROCESS DEVIATION 2.0% (444.8 N)

## 2.4 Signature Learn settings

Following a new setup and validation of crimp dimension, the CPM5000 is placed into Learn mode. A minimum number of crimp samples are captured and averaged to compute the new learn reference signature from which all production signatures will then be compared. The Signature Learn configuration setting functions are as follows:

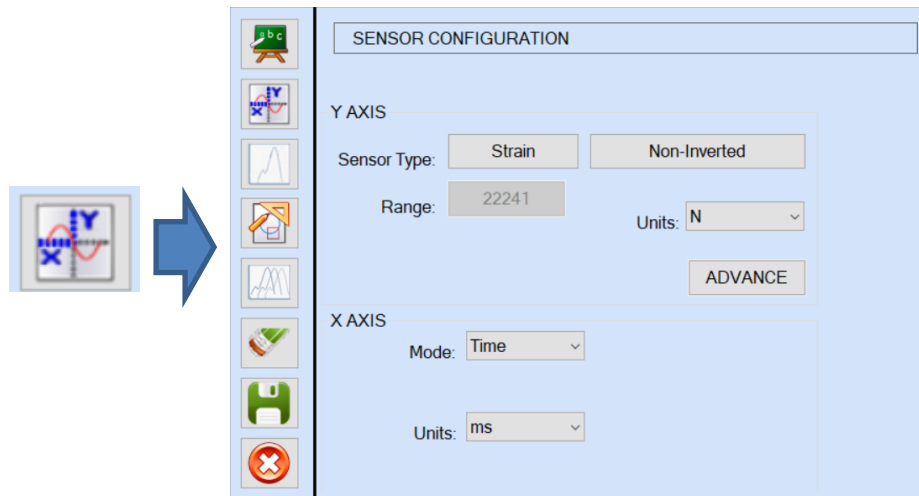


- **Maximum Learn Variation** - The CPM5000 captures and averages the selected minimum number of crimp signature samples to establish the learned signature from which all production crimp signatures will be compared. The Maximum Learn Variation is entered as a percent of the maximum variation between each learn signature. Signature samples within 3% variation relative to the previous signature are accepted as Learn samples, while signatures with variation greater than 3% of the previous sample average are excluded from the learn.
- **Minimum Samples** – is the minimum number of learn samples to establish the learn reference signature. The selected minimum number of learned samples can be set between 1 and 10 samples.
- **Maximum Samples** - Is the maximum number of Learn samples/machine cycles to establish the reference signature. If for example the signatures captured exceed the variation, then the maximum samples may be reached resulting in a “FAIL TO LEARN” condition and the machine will be inhibited.
- **Stop After Learn** – Stop the machine after learning for validation of the part.
- **Learn Timeout** – Is a timer activated on learn and will stop the press when the time is reached. This is to prevent use of the press without learning. It is specifically designed for bench press operation.
- **Target Recalculation** This allows the crimp reference signature to adjust to normal changing process conditions. The value is the interval of good parts at which the recalculation is performed. For example, the default value of 16, means that a target recalculation is performed every 16 good cycles with error that is below the recalculation limit.



- **Process Deviation** Is a maximum limit on the Target Recalculation to prevent excessive drifting of the process from original learn.

## 2.5 Sensor Configuration settings



The CPM5000 is compatible with OES full series of piezo dynamic force sensor options – Strain, SenFit PBT, and force ring. Select the specific type of piezo sensor from the menu.

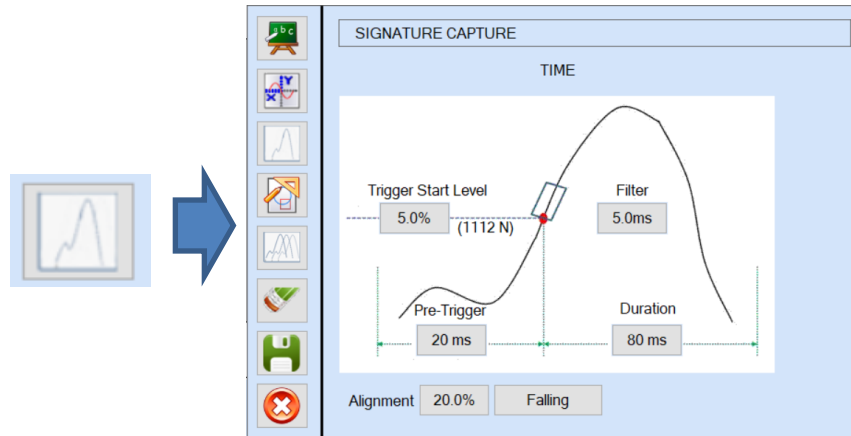
Direct piezo force sensors are physically mounted in series with the compression force during the crimping process. Direct piezo force sensors are mounted in the ram or baseplate of the press and have a calibrated maximum force range, which is entered as the **Range**. The Voltage output at the calibrated maximum force range of the sensor is entered in milli-volts. The **Display Units** refers to the preferred engineering units for display of the force measurement - LB, KG or N.

Piezo Strain sensors are indirect sensors that monitor the micro deflection of the press frame during the crimping cycle. The strain sensor is bolted to the frame and provides a u-strain output relative to the tension or compression exerted on the frame during the crimping process. This tension or compression output is scaled to engineering units to provide an absolute force measurement relative to the crimp force applied. (*\*\*OES CAL5000 press analyzer is optionally used to automatically scale the OES CFM with strain sensor to an accurate absolute force measurement. In many cases, calibration to absolute force measurement is not required since crimp force monitoring is relative measurement to detect the relative change in the process variation rather than absolute measurement*).

The mounting location of the strain sensor will determine the selection of tension (Non-inverted) or compression (Inverted). In most applications, the sensor is set at tension, monitoring the micro tension (deflection) of the press frame during the crimping process.

## 2.6 Signature Capture settings

The force signature capture default settings will provide correct signature capture for most standard crimp presses. With the monitor in learn, cycle the press, and confirm that the entire signature is captured and displayed. If the crimp signature is cutoff at the beginning or end of the cycle, then there will be requirement to review and adjust the force signature capture configuration settings.

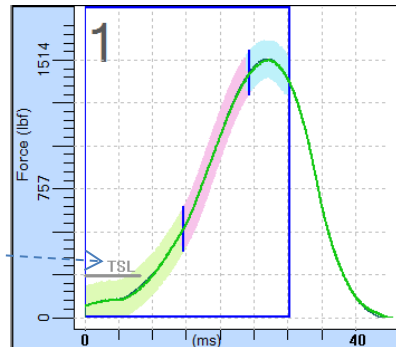


A detailed explanation of each of the Force Signature Capture setting is as follows:

**Trigger Start Level (TSL)** – the CPM5000 is normally configured for automatic trigger referencing the input threshold level of the force sensor input to trigger the signature capture.

The TSL is set as a % of the sensor input range with a default setting of 5%. The trigger start level (TSL) is displayed as shown.

**Filter** – eliminates false trigger by ensuring that the force input is greater than the TSL threshold for the filter time (default is 5 milliseconds). Signature capture will be initiated after the force input exceeds the TSL and maintained for the filter time period.



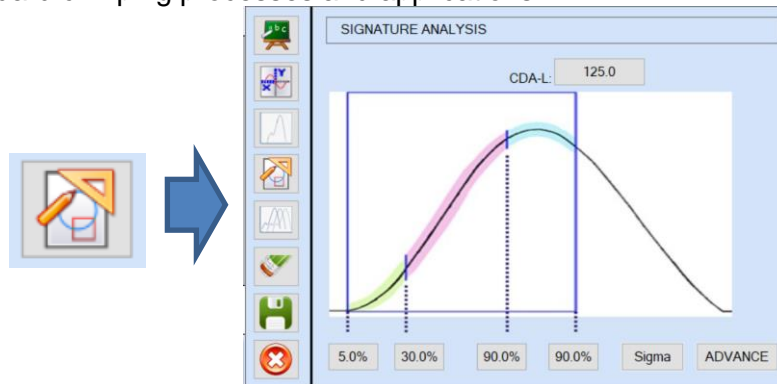
**Pre-Trigger** is the time period in advance of the Trigger Start Level to capture the beginning of the force signature. This time period is entered in milliseconds. The default of 20ms will ensure capture of the complete force signature for typical crimp presses. Certain crimping presses with a slower press cycle rate may require a longer pre-trigger time to capture the complete crimp force signature.

**Duration** is the time period to capture the complete crimp force signature following the Trigger Start Level. This time period is entered in milliseconds. The default of 80ms will ensure complete capture of the force signature for typical crimping presses. Certain presses with a slower cycle rate may require a longer duration time to capture the complete crimp force signature.

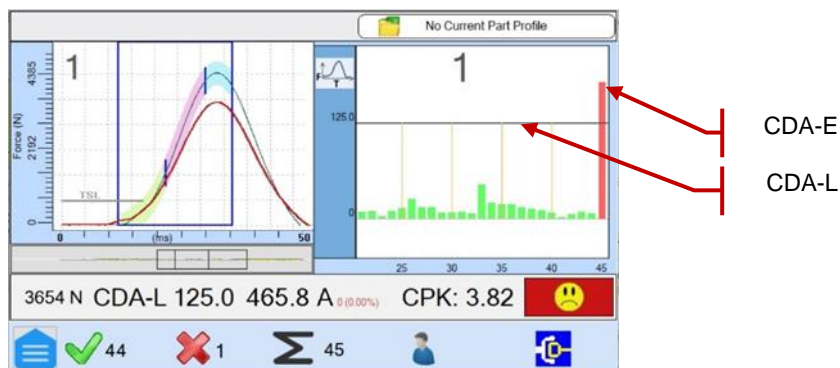
**Alignment** aligns the reference learned force signature with the force signature of every production crimp. The default alignment is 20% of the falling edge of the force signature.

## 2.7 Signature Analysis settings

The force signature analysis has default settings that should ensure correct analysis for most standard crimping processes and applications.



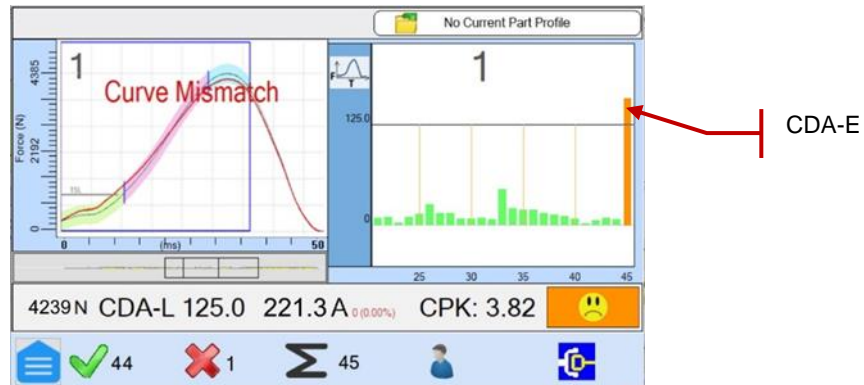
Cumulative Deviation Analysis (CDA) computes the crimp process variation error on 3 regions of the force signature when compared to the learn signature. The computed error from each region is weighted and accumulated for a total CDA-E. The CDA-E is normalized to a value relative to a maximum process variation limit of 125.0.



**CDA-L** - is the cumulative deviation analysis maximum limit. The CDA Error is compared to crimp deviation analysis limit (CDA-L) for determination of Pass or Fail.

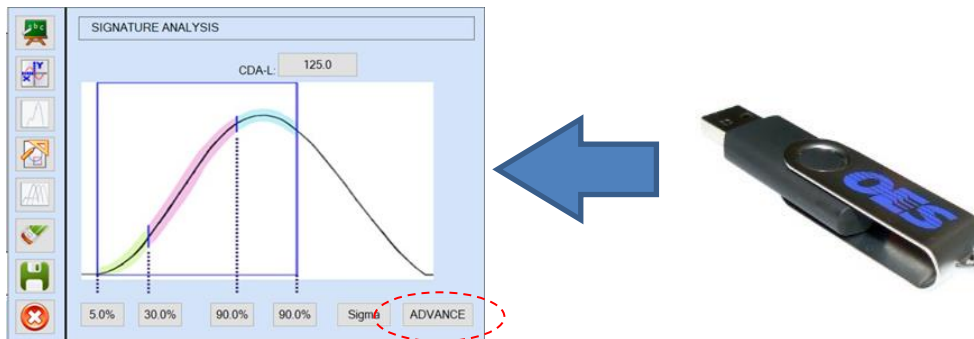
**Curve Mismatch (CMM)** – utilizes Cumulative Deviation Analysis and analyzes the signature for shape change that is characteristic of high insulation. The CMM is normalized to a value relative to a maximum process variation limit of 125.0. If the Curve Mismatch error exceeds 125.0 this will be considered a crimp defect, and the appropriate output signal is sent to the press or machine for control of the crimp defect. The greater of

CDA-E or CMM-E is displayed and the crimp error is confirmed by color – RED = CDA-E, and ORANGE = CMM-E.



### \*\*\* Advanced settings

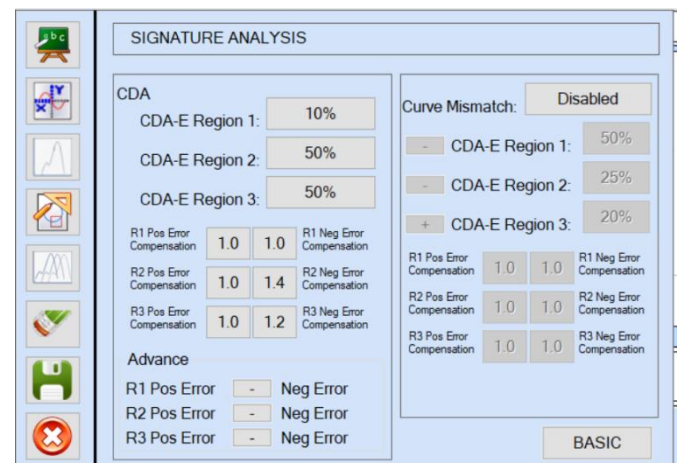
Certain unique crimping applications may require changes to configuration settings that are in the Advanced Settings. These settings are accessed by installing an external OES USB stick.



Press the “Advance” button to display the advanced settings screen and display the current default settings as shown.

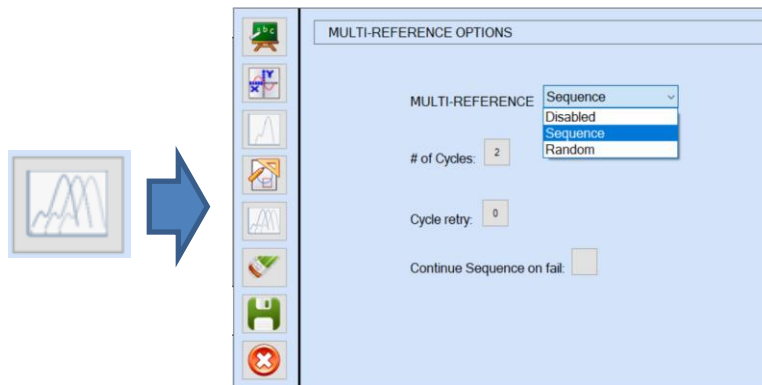
Note that the setting defaults have been established and optimized following extensive testing for a wide range of wire crimping processes and under typical crimping processes should not require any adjustment.

For special applications where an adjustment is required please send a log file with information to OES to help with the adjustments.



## 2.8 Multi-Reference Options settings

Multi-Reference allows the CPM5000 to create 1-8 different virtual channels for multiple wire using the same terminal. Sequence selection is in order 1...2...3...1...2...3 etc. Random is using a BCD method with the Input settings.

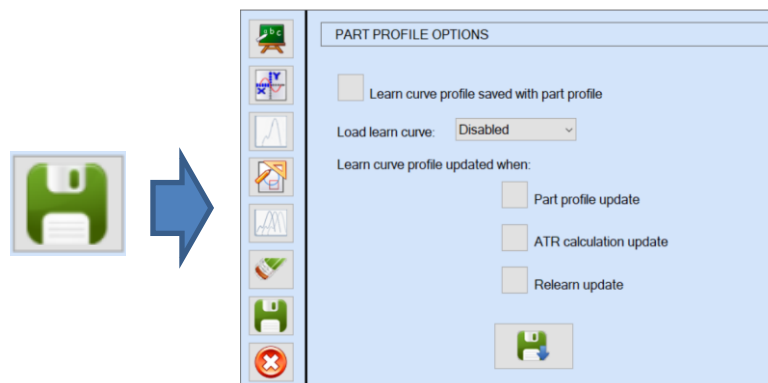


## 2.9 Counter Options settings



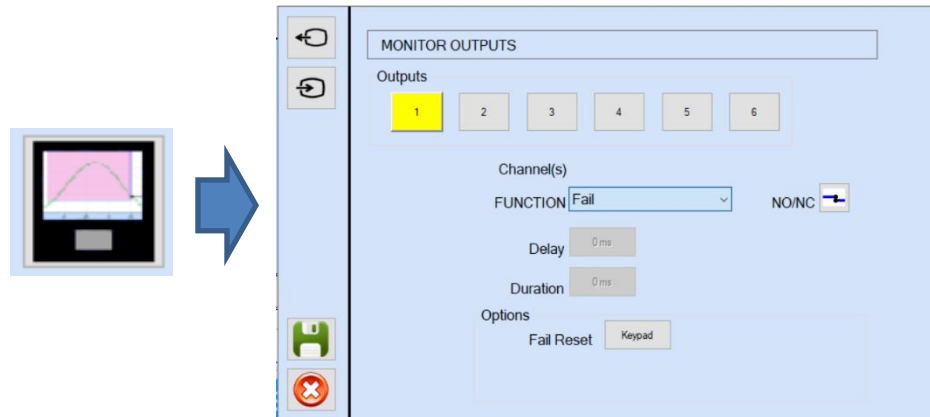
## 2.10 Part Profile Options settings

Creating and saving a Part Number / Part Profile. This will save all the settings as is in the configuration and then allow you to save the learn curve.



## 2.11 Machine Interface & Control

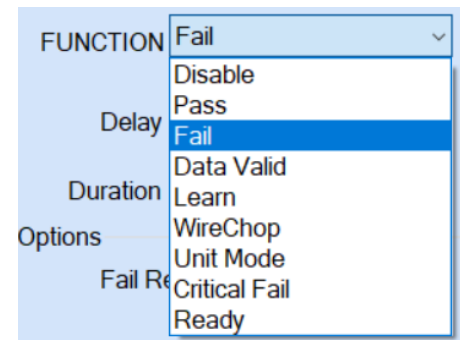
Following successful signature capture, signature analysis, and achieving a repeatable crimp monitoring process (producing good parts with minimum unnecessary scrap/good called bad), the 4th step is to connect the CPM5000 with the press or the machine. An electrical interface is determined following the electrical interface instructions from the press or machine supplier.



## Outputs

There are 6 independent output relays that can be assigned to preset functions for channel 1 and/or channel 2:

- Disable – disables the output
- Pass – output enabled for PASS
- Fail – output enabled for FAIL
- Data Valid – output enabled for PASS or FAIL
- Learn – output enabled when the channel is in Learn Mode
- WireChop – output enabled for control of WireChop
- Unit Mode – output enabled when unit is powered on
- Sigma Fail – output enabled for Sigma FAIL
- Critical Fail – output enabled at 150% of CDA-L
- Ready – output enabled when monitor is finished processing any data and ready for next cycle



Each function can be assigned to an output relay. There are 3 types of relays. Relay 1 and 4 are mechanical dry contact relays @ (2A/30VDC-2A/240VAC), Relay 2 and 5 are mechanical dry contact relays @ (1A/30VDC) and Relay 3 and 6 are Solid State relays @ (500mA/24VDC)

Assign the function to the relay that best meets the electrical interface requirement for the bench press or automatic machine. The **NO/NC** (normally open/normally closed) is the selected “standby state” of the relay. In the event of a crimp defect the output(s) is/are enabled to control the machine.

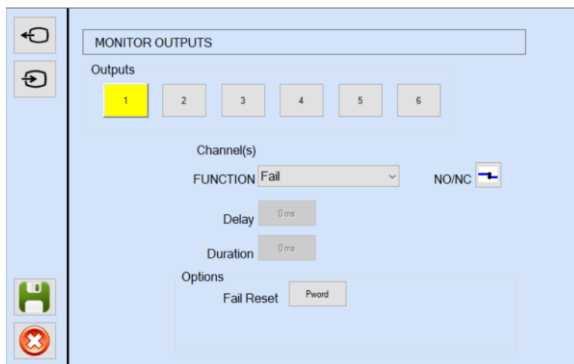
The output relay **Delay** is the time in milliseconds after a part has passed/failed that the relay will remain in standby state prior to activating. The **Duration** is the time in milliseconds that the relay will be activated if the reset method is set to Timed.

The **Fail Reset** provides a number of options to reset the CPM5000 and output relays for continued production. The options are:

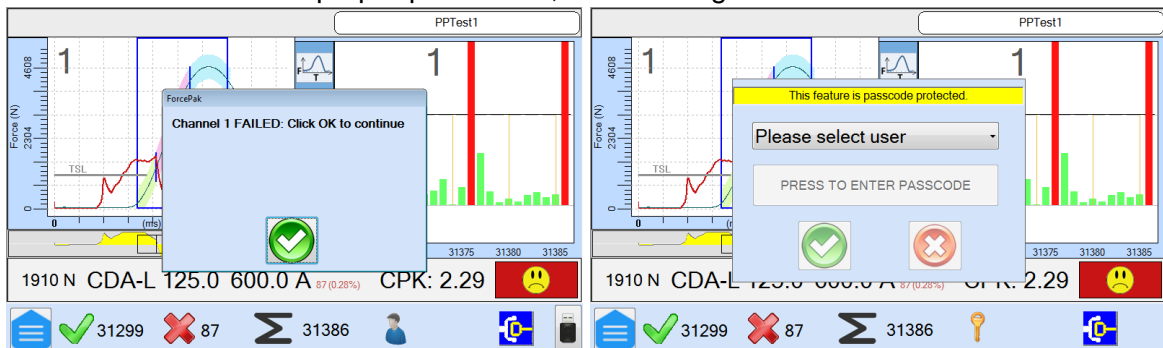
- Timed – the output will return to standby state after the Duration time specified
- Keypad – the operator must acknowledge error by touching reset prompt on CPM5000
- Password – must be entered to release output to standby state
- Input 1-4 – assignment of any of the 4 inputs, which must be enabled to release, output to standby state (example external machine control, external key switch, etc.)

### Bar code reset option:

1. Select Fail Reset as Pword.

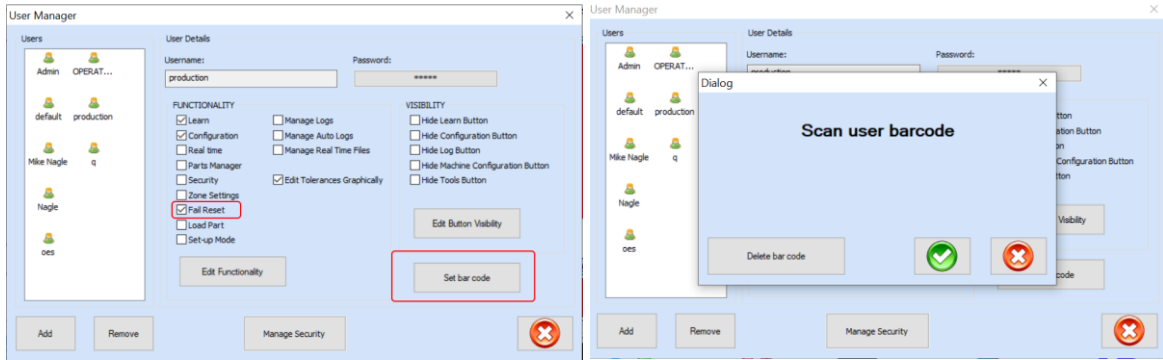


2. When a fail occurs with proper permission, scan a badge and reset will be activated.



3. Security permission is needed for each user to have the ability to reset a failure by bar code. User ID bar code format "Code-128" must start with Uxxxxxxx\n, x being your password.





## WireChop Control

The WireChop output provides control of WireChop device to automatically cut the wire short following a crimp defect for error proofing the production operation.

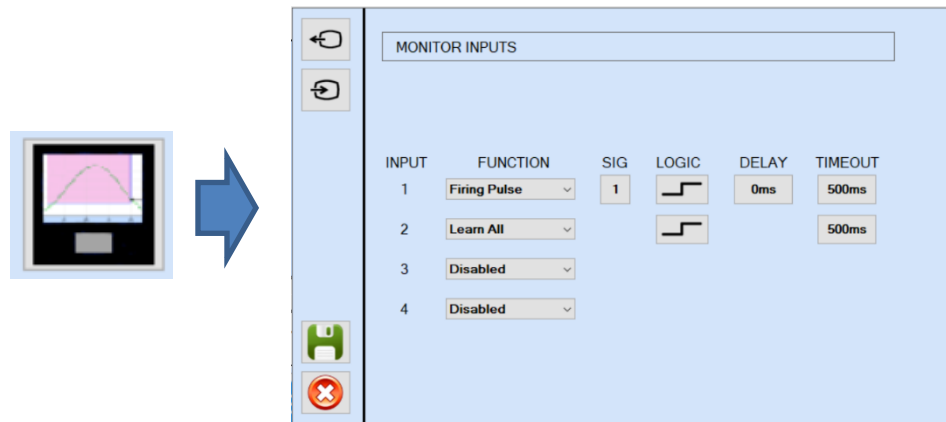
Chop Station	<input type="text" value="0"/>	Chop on Run	<input type="checkbox"/>
Chop on Start	<input type="checkbox"/>	Chop on Learn	<input type="checkbox"/>

- **Chop Station** – This is for wire transfer or conveyor applications where the WireChop device is mounted downstream from the crimp press. For these applications, the number of stations downstream is entered as the Chop Station (determined by the number of press cycles). For most applications, this is set to 0.
- **Chop on Start** automatically cycles the chopper when CPM5000 is placed into Learn Mode
- **Chop on Run** automatically cycles the chopper following crimp defect in normal production mode
- **Chop on Learn** automatically cycles the chopper following every crimp cycle in Learn Mode to destroy all Learned parts



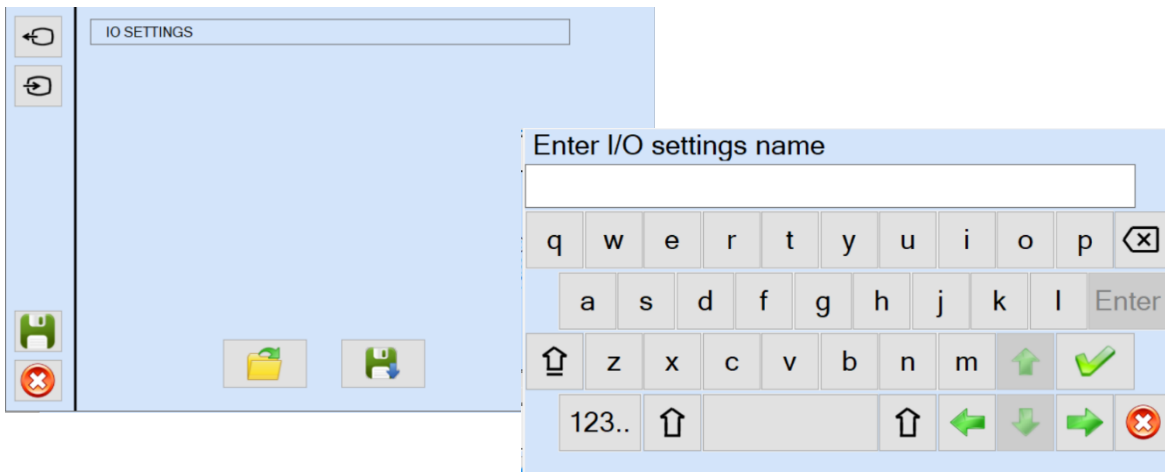
## Inputs

There are four independent 24VDC inputs that can be configured for channel 1 and/or 2. The inputs can be assigned to the following functions:



- Firing Pulse – is an option to trigger signature capture with an external input signal. An input is assigned to Firing Pulse, which is a momentary input signal that triggers the press cycle. The trigger is configured to activate on the positive or negative going signal from the input. Firing Pulse Timeout is the maximum time after the input is received in which the crimp curve must occur.
- Learn All – input from an external device will automatically activate a re-learn.
- Disabled – not used.

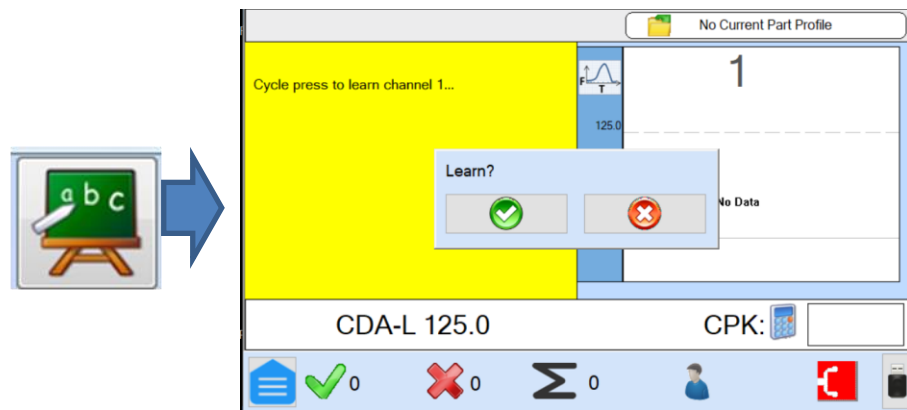
Once all machine settings are set as desired you can save the machine configuration files for later use. Select the Save ICON and enter a name.



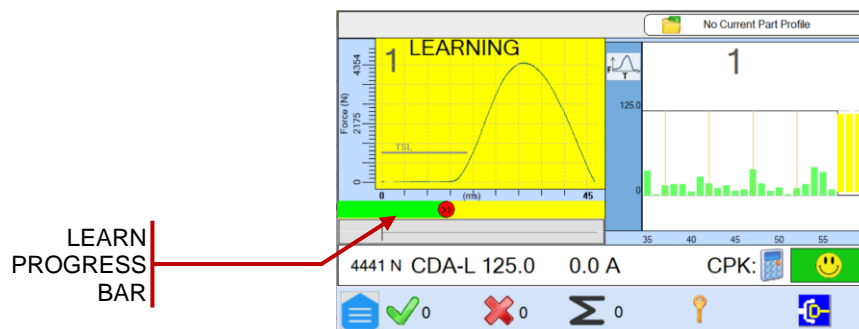
### 3.0 - Operation

### 3.1 Learning a Process

1. From the main menu press the LEARN icon. Press CH1, CH2, or ALL



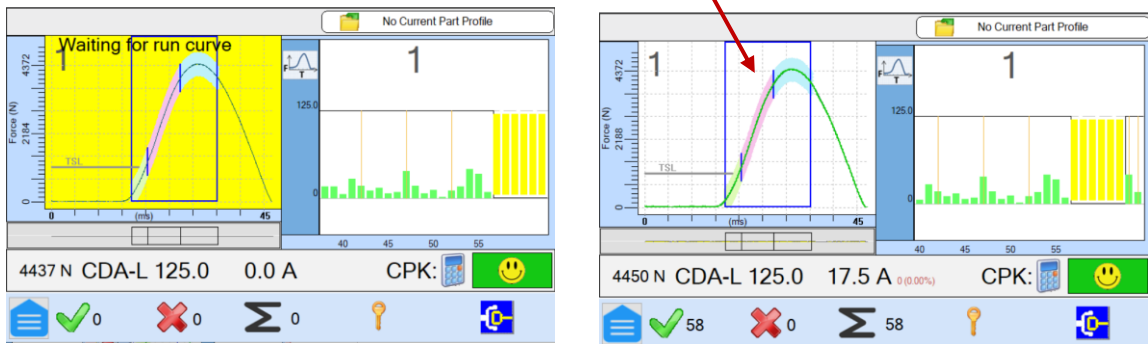
2. Cycle the machine/Press and the CPM5000 will learn automatically.



The progress bar at the bottom of the screen confirms the LEARN process. A preconfigured minimum number of crimp samples are required to create a new LEARN reference signature from which all production signatures are compared.

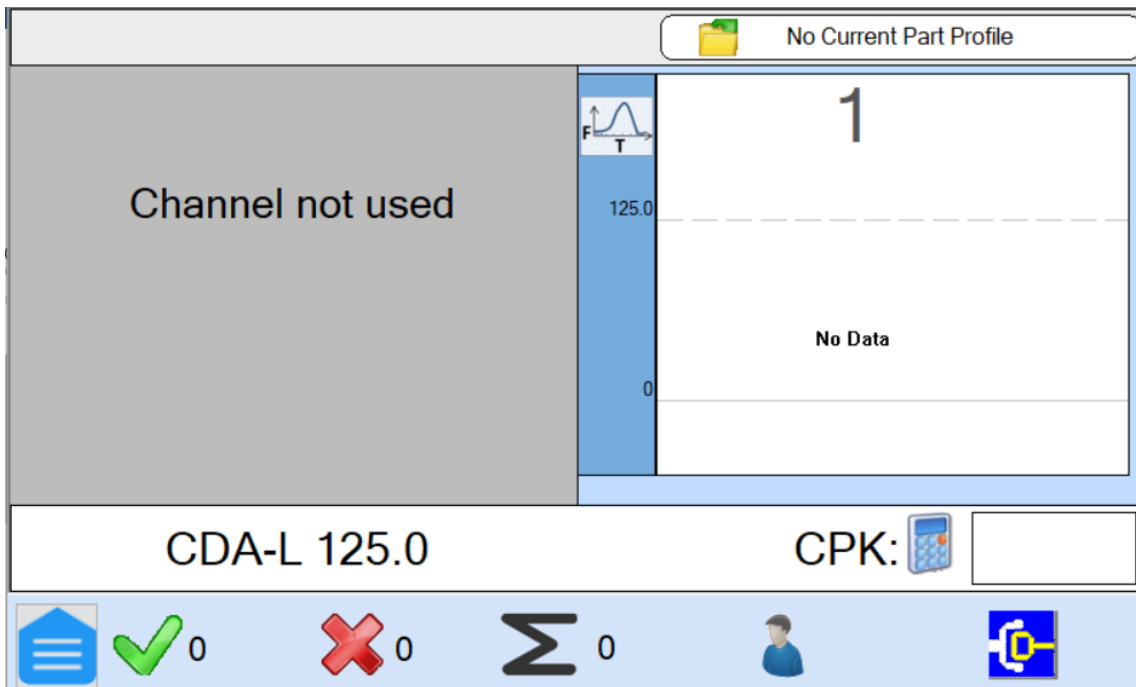
Following a successful LEARN process, the horizontal progress bar will disappear, the production screen will turn white, PASS/FAIL counters are active, and trend screen is activated.

## PRODUCTION MODE



To perform a new setup or changeover to a different crimp process there is normally no requirement to make changes to CPM5000 configuration settings or tolerances. The default configuration settings will provide consistent high performance for most crimping processes and terminal/wire combinations.

The Channel not used message only appears when the CPM5000 unit is in learn mode and there are no learn cycles, the learn timeout occurs (10 minutes) and will display the following screen and stop the press. There is no timeout if the unit is not used after learning.

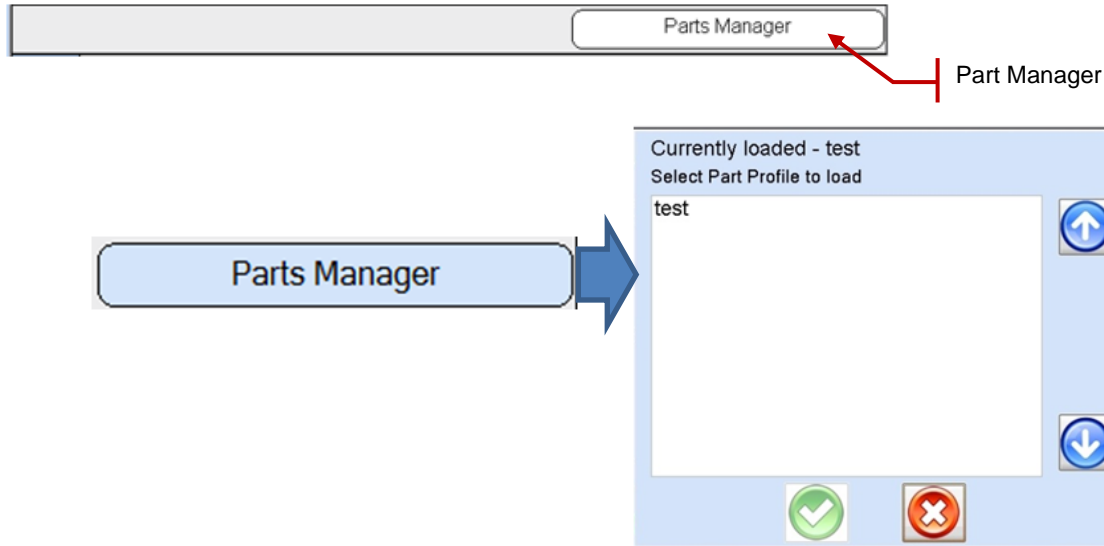


For certain, challenging crimp monitoring processes, there may be a requirement to adjust the configuration parameters to optimize the crimp monitor performance. For these applications, the configuration parameter set can be saved and recalled for efficient changeover, see Part Manager section.

## 3.2 Part Manager

Part numbers can be assigned to terminal/wire combinations that require unique set of configuration parameters. These CFM configuration parameters are automatically recalled and applied by part number. The CPM5000 can store an unlimited number of configuration settings.

The part number is displayed at the top right corner of the operator screen.




The Part Manager is an option that allows the user to enter a part number and assign crimp configuration parameters specific to that terminal wire combination. Part number selection will automatically load the unique configuration parameters specific to that terminal wire combination and send the CPM5000 into learn mode or load a preset learn curve. The Part Manager configuration parameters may include Signature Learn, Signature Capture, Signature Analysis, etc.

### **Bar Code Scanner Setup:**

Insert standard ASCII bar code reader into available USB port. The reader must be set with an ENTER KEY (ForcePak is looking for the LINE FEED at the end of the bar code \n).

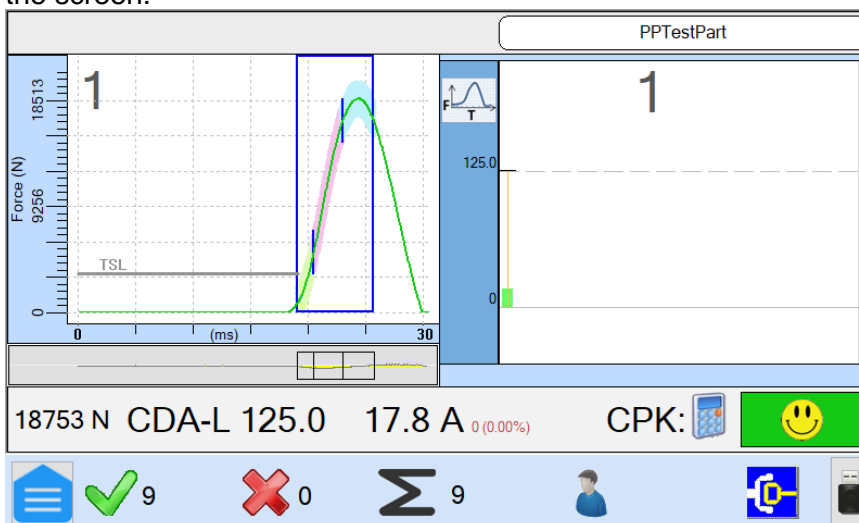
### **Saving Part Profile with bar code:**

For the Part Profiles to be loaded by bar code input. The Part Profile must be created on the CPM5000 and create a part number by bar code format "Code-128". Select save  and then scan the Part Profile number. \*\*\*must start with PPxxxxxxx\n\*\*\*, x being your part number. This way the operator will not have to select load part number, the CPM5000 will know once scanned PP to load a part profile.



### **Loading Part Profile with bar code:**

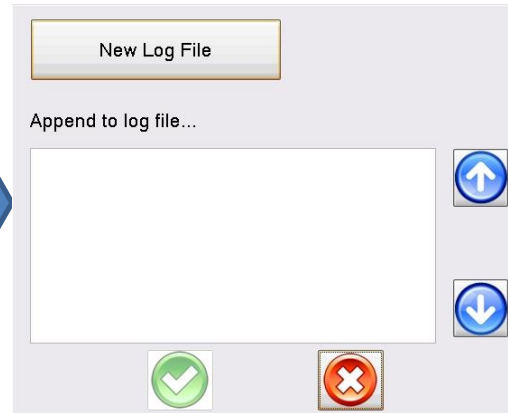
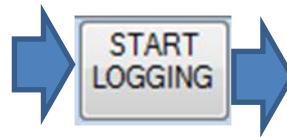
To Load a Part Profile using the bar code scanner, Scan the bar code when in the Main Screen of ForcePak. The Scanned part profile name will be shown in the top right corner of the screen.



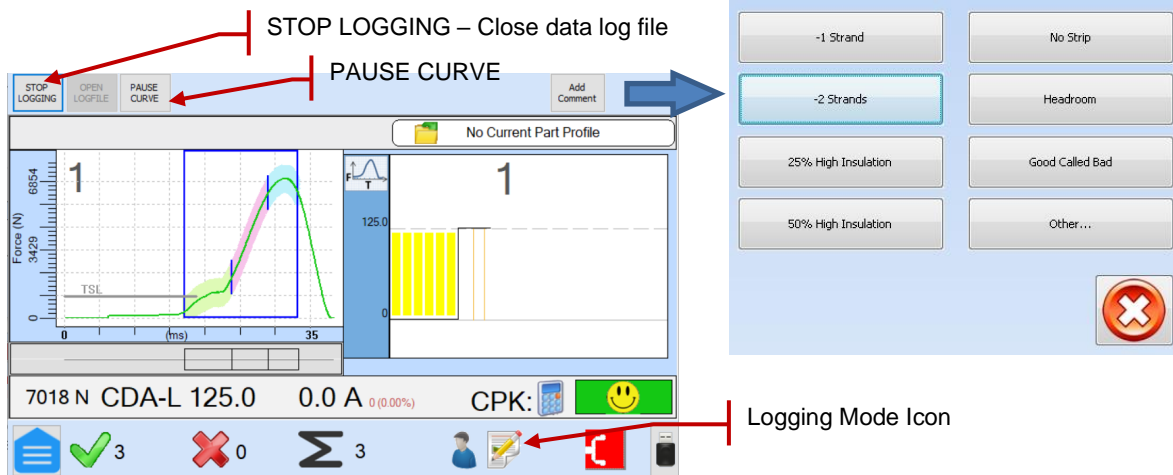
## **3.3 Crimp Data Log Files**

The CPM5000 has capability to log all production crimp data including the crimp signature, process trend, and configuration settings. The data from each crimp is automatically logged and time stamped for 100% traceability of crimp process data. Also, a user can optionally setup to store crimp data as follows,

Press the Data Files icon, press Start Logging, and enter the Log file name followed by the Check button. The CPM5000 will log the data from each crimp produced including the signature and all configuration parameters by time stamped by date and time. Press the Stop Logging button will end the log file.

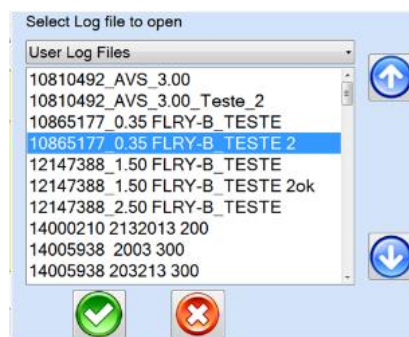
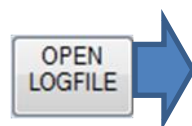


While recording a Data Log File, the user may add comments to specific samples/curves for further review.



When the curve is Paused, the CPM5000 continues analyzing all new crimps and storing into the log file, but the unit will allow you to scroll through previous stored data to preview and add comments.

Press the Open Log File button to recall crimp data log files. Select the file of interest and press the green check will open the file for replay on the CPM5000 screen.



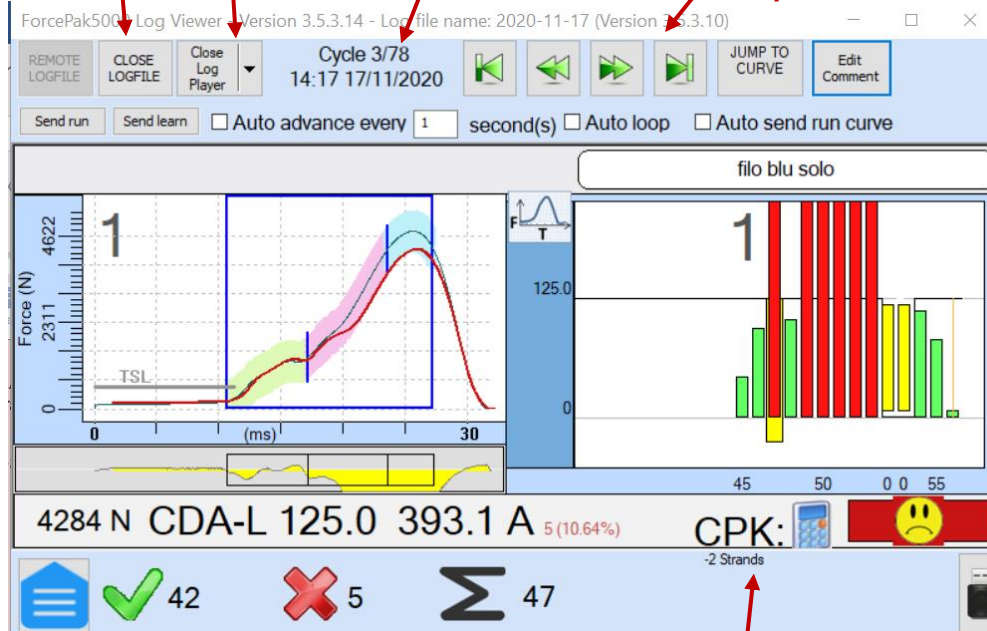


LOG PLAYER – To replay data and test configuration

OPEN/CLOSE – Log files

Current and Total number of crimp cycles in the log file

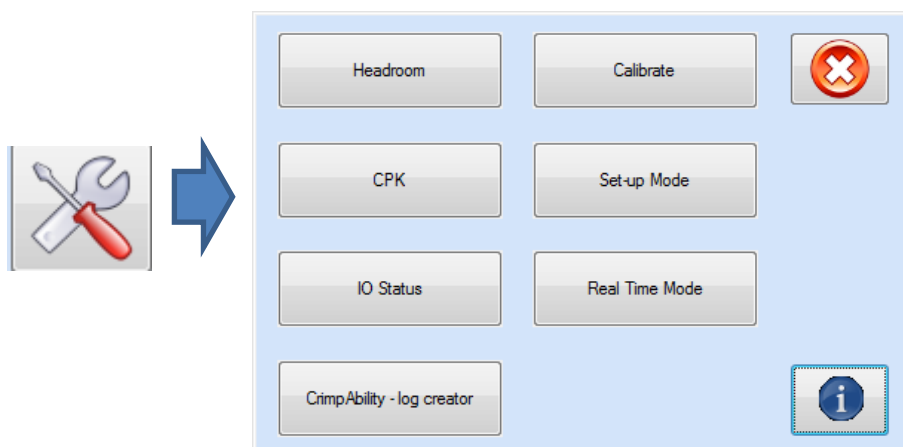
Forward and Rewind buttons to scroll through the crimp cycles.



Comments – View/Edit comments added while logging the file and/or Add comments

## 4.0 – Tools

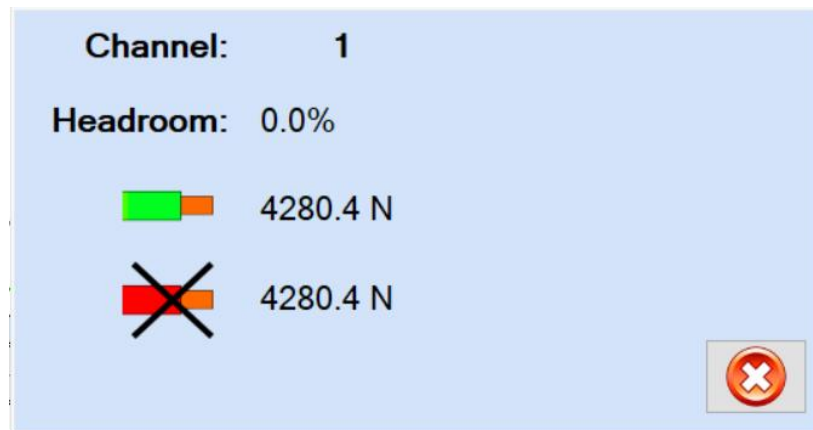
The Tools menu provides menu options in support of process monitoring, maintenance, and troubleshooting.



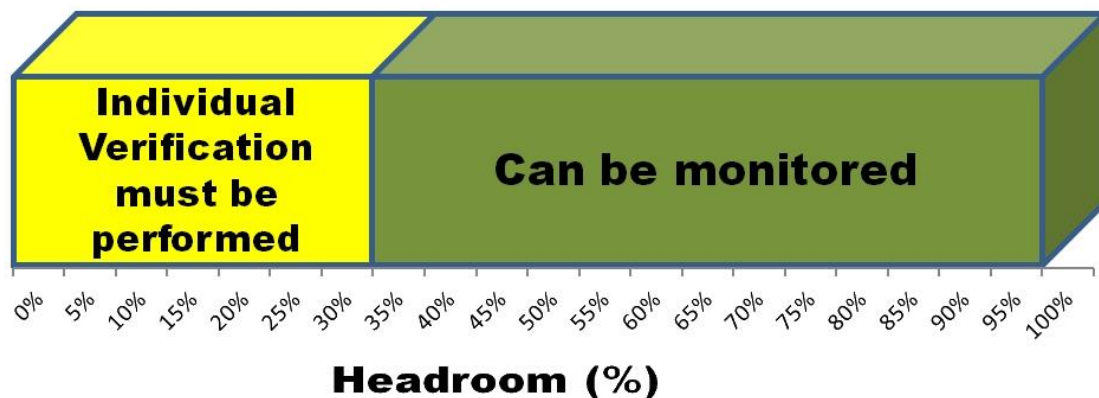
## 4.1 Headroom

Headroom is a useful tool to determine the capability of the CPM to detect missing strands for various terminal wire combinations. The terminal hardness contributes to a lower headroom and reduced capability to detect missing strands, compared to a softer terminal crimping the equivalent wire. Another contributor to reduced headroom is high compression of the conductor core. Headroom is a calculation of the % difference of the peak force of a crimp with and without conductor. An example calculation is as follows:

Peak force with 100% of the conductor in the conductor core crimp=x  
Peak force with 0% of the conductor in the conductor core crimp = y  
 $\% \text{ Headroom} = x/y \times 100$

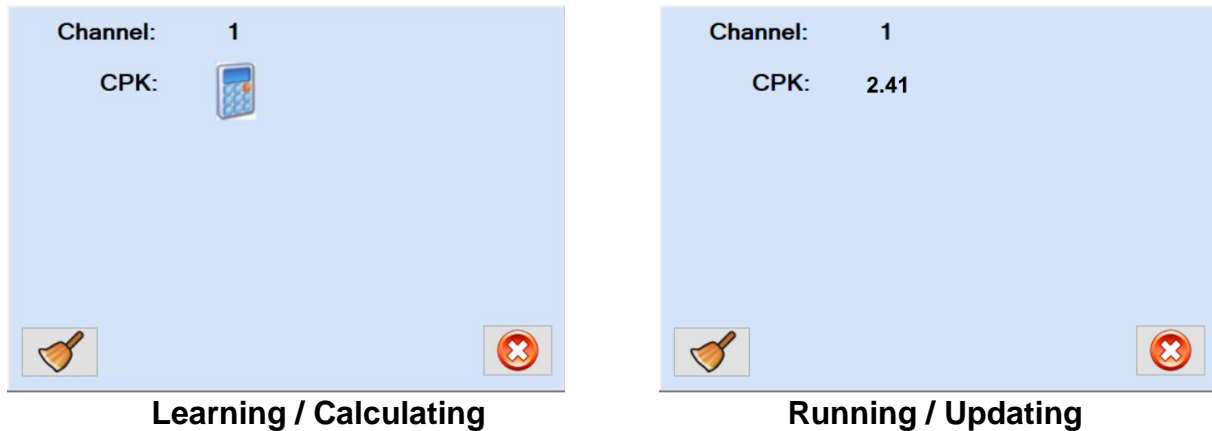


A headroom > 30% can be effectively monitored using standard OES configuration settings. For headroom < 30% the configuration settings should be carefully reviewed and configured as required to confirm crimp defect detection capability. Optimized configuration settings can be assigned to a part number for recall of configuration parameters specific to those low headroom crimping combinations.



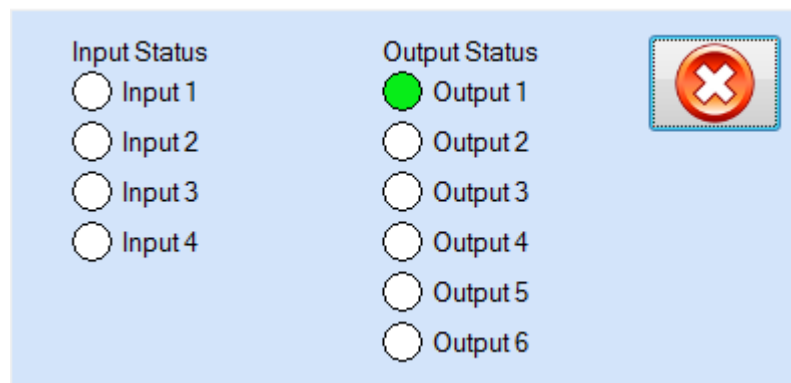
## 4.2 CPK

The CPK is calculated on the peak value of each cycle. This value is continuously updated as the cycles occur. It takes 16 pieces to display the first calculation.



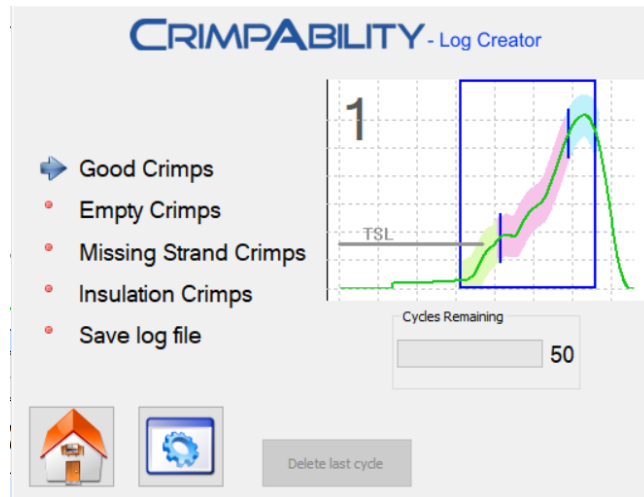
## 4.3 I/O Status

The CPM5000 input status is displayed in real time. This is supportive of new installations and troubleshooting electrical interface issues.



## 4.4 CrimpAbility – Log creator

This allows the user to create a file that can be used for improving the defect detection capability of an application. Create the CrimpAbility file and send to OES for review.

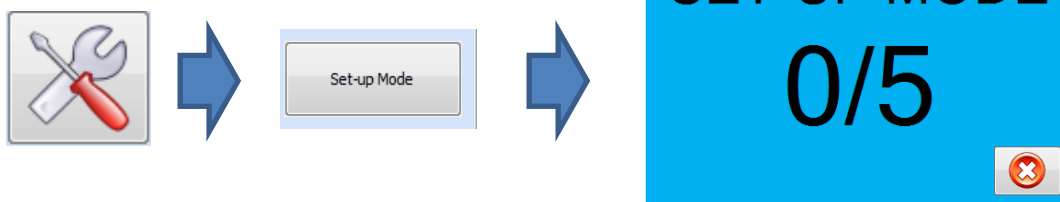


## 4.5 Calibrate

This allows calibration of the unit by a 3<sup>rd</sup> party device. The USB calibration stick/key. "CalibrateCFM.dll" must be on USB stick to have this function.

## 4.6 Set-up Mode

The **Setup Mode** is an option that can be enabled or disabled to allow the press to cycle for a set number of press cycles to facilitate mechanical setup of the crimp dimension without press interruption.



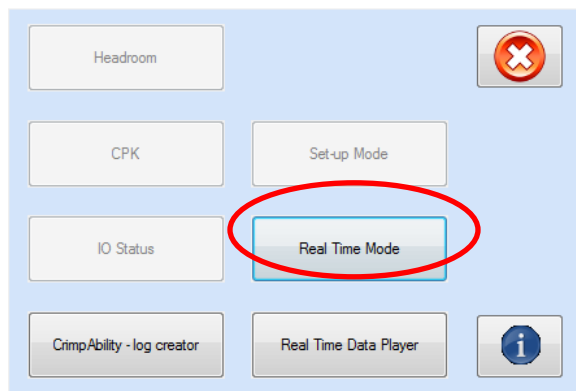
Once set-up is completed, the crimp monitor will be put into Learn mode to capture the crimp force signature from a preset number of press cycles to establish the reference curve from which all production crimps will be compared for quality.

## 4.7 Real-time Mode

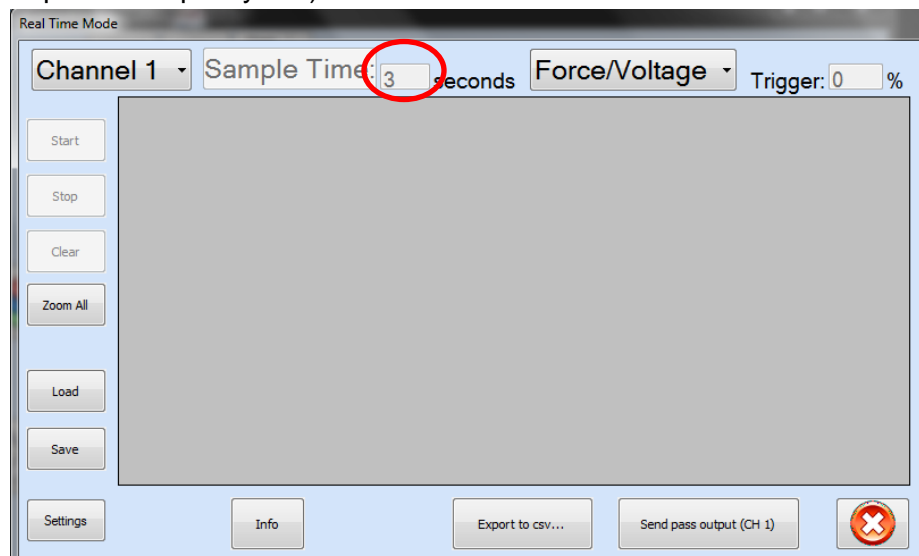
*Real Time Mode* is a feature, which will allow the CPM5000 to gather raw data from the sensor and is primarily used to determine signature capture parameters and troubleshoot signature capture problems for difficult applications. Once the signal reaches the trigger level, the CPM5000 will sample the raw sensor data for the configured sample time. The amount of data captured is based on time After uploading the data to the software, the user will have the ability to view and analyze the data with the built-in tools.

To capture the data, do the following:

1. Load Real Time Mode (Tools icon  -> Real Time Mode)

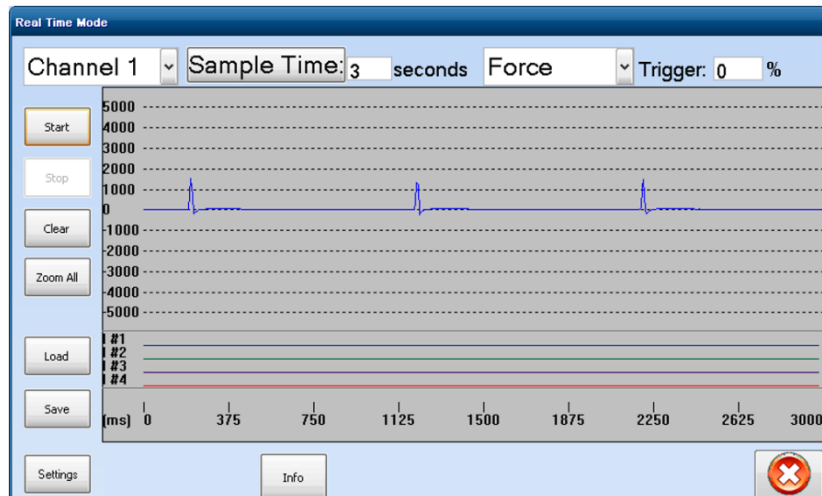
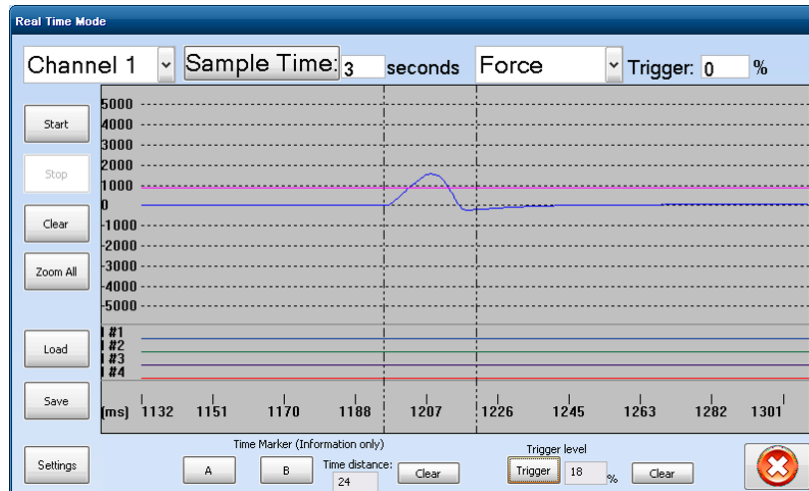


2. You can change the amount of time it will capture the data by click on the box after the Sample Time: button. (You can change this number up to 60 seconds, so you can capture multiple cycles)



3. Press the start button
4. Cycle the machine, press the stop button, or allow the time to elapse

Now you can save the data to a file, review it, etc.

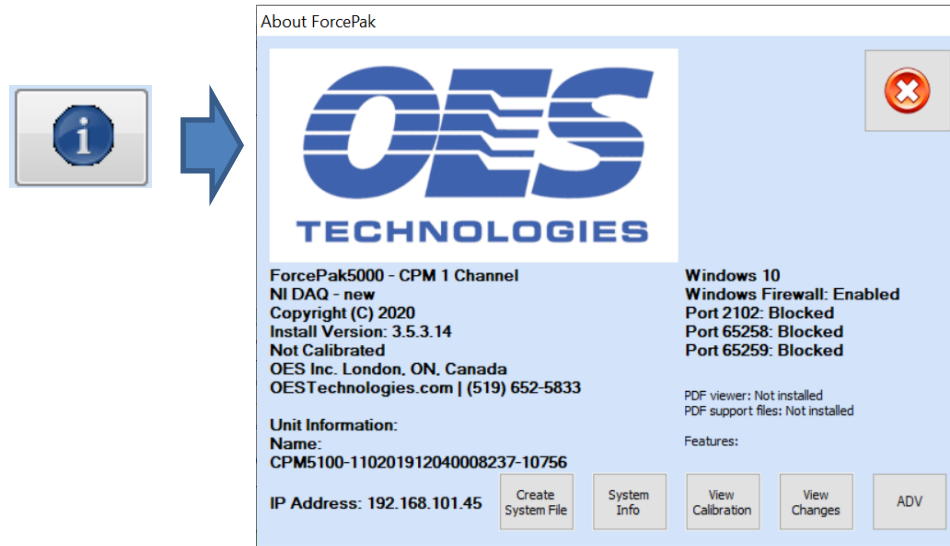


Real Time Mode has a measuring tool

1. If you press the Info button on status bar on the bottom of the screen, the status bar will give you a Time Marker feature.
2. Press the A button and click on the first point
3. Press the B button and click on the second point
4. It will now show you the distance between A and B
5. Press the red circle with the X to close the tools bar

## 4.8 Information Screen

The CPM5000 information screen confirms the CPM5000 software version and provides utilities for upgrading the CPM5000 software.



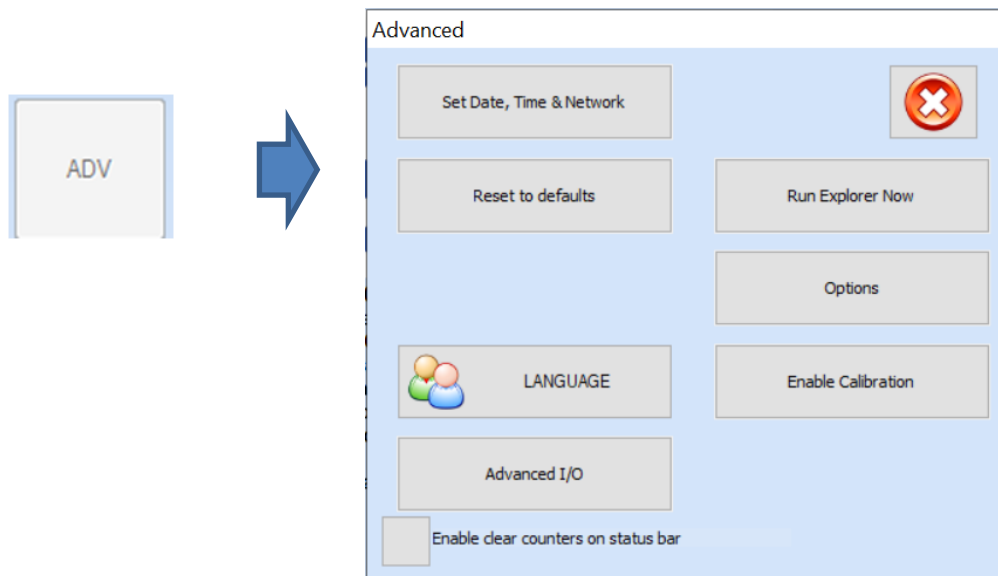
Create System file - This file is requested for adding a new feature or License to your CPM5000.

System Info – Is for support and troubleshooting.

View calibration – To view any Calibration certificates

View changes – To view the list of changes in versions.

Advanced - advanced menu options requiring ADMIN privileges.






1. Set Date, Time, and Network – Change the date, time, and View/Configure network settings.
  - a. The unit name can be set to a location or production line or press name and then this name will appear on all logged files and documentation.
  - b. Set Date to current.
  - c. Set Time to current (24-hour time)

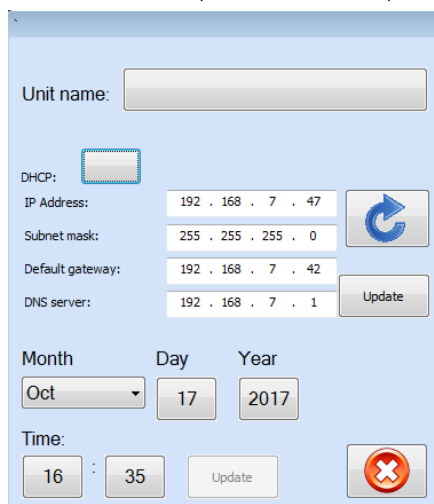
Ethernet connection on a regular network uses DHCP.



When using DHCP the network will assign the CPM5000 unit an IP Address. To acquire the IP address might take some time depending on the network size. When plugged in you can refresh the IP address with the refresh button.  This button requests the information again.

Changing the CPM5000 to use a static IP address the Ethernet cable must be plugged into the unit. On a new hardware unit, it is the left Ethernet plug.

- a. Set IP address, Subnet mask, Default gateway and DNS server values.



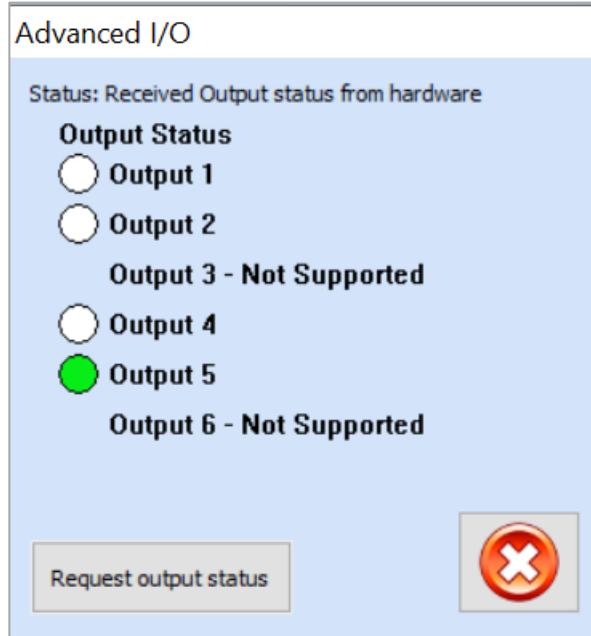


- b. Select Update and wait approximately 2 minutes for the update to finish. Status update appears in window, \*\*depending how fast the network refreshes.

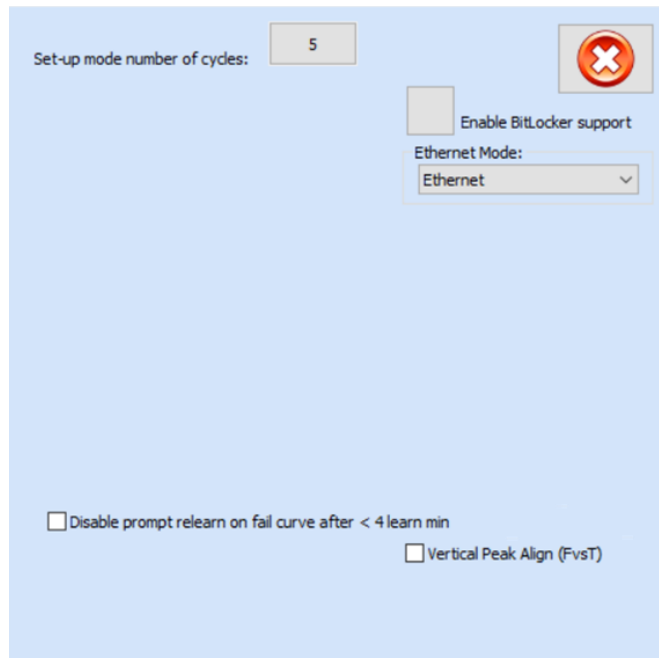
- c. The unit will then retain this IP address until a change is made.

2. Reset to Defaults – Restore the defaults of the unit to factory defaults or defaults set by the administrator.

3. Language – allows for Language selection
4. Advanced I/O - is for troubleshooting output issues as it can read what the DAQ board says the output status is.

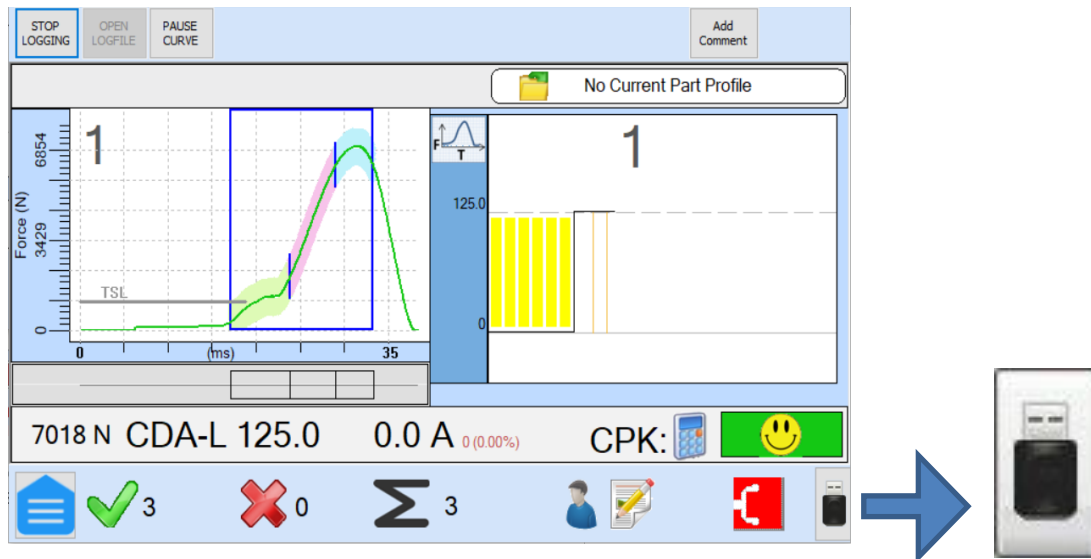


5. Run Explorer Now – Used for advanced diagnosis functions only.
6. Options – To adjust the number of cycles allowed for Set-up mode.

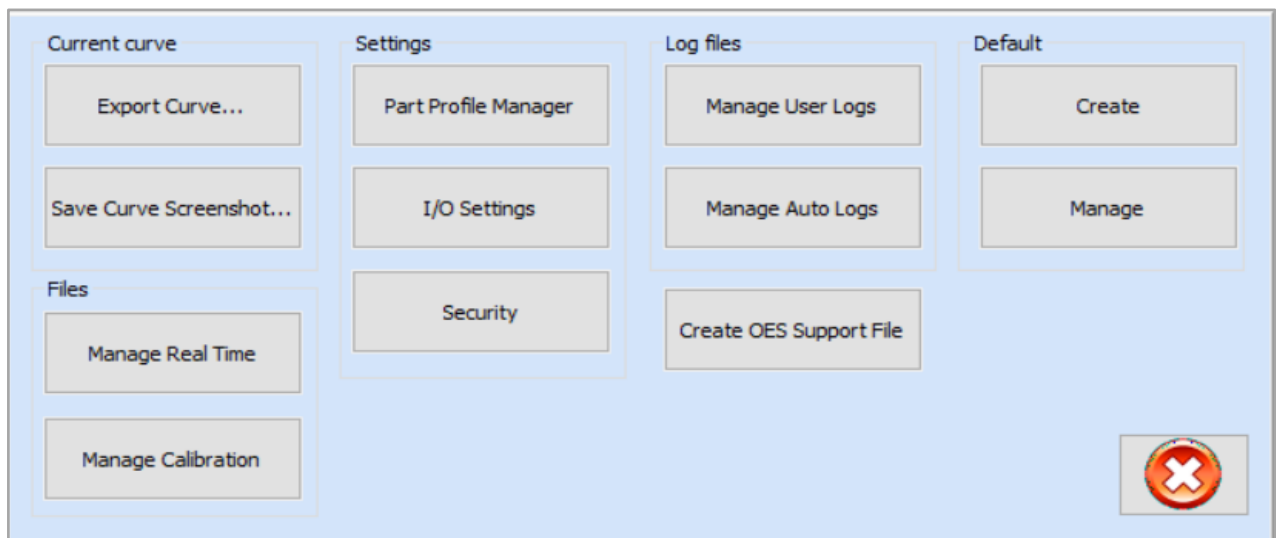


7. Enable Calibration – is used when calibrating with the OES CAL5000. It activates the serial communications for the CAL5000 to connect to the CPM5000.
8. Enable Clear counters on status bar.

## 5.0 – Administrator USB Utilities

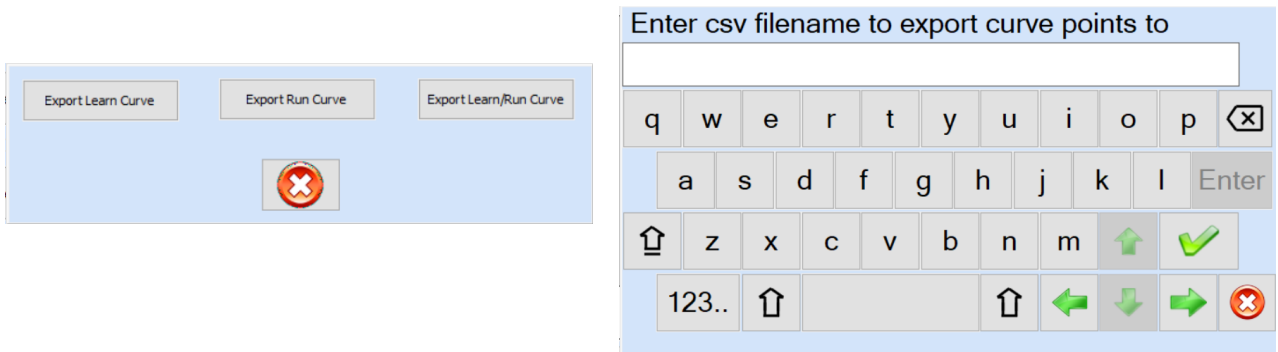


These utilities allow the Administration to access features not available to the operator. Click on the USB icon to access the Administrator USB utilities.



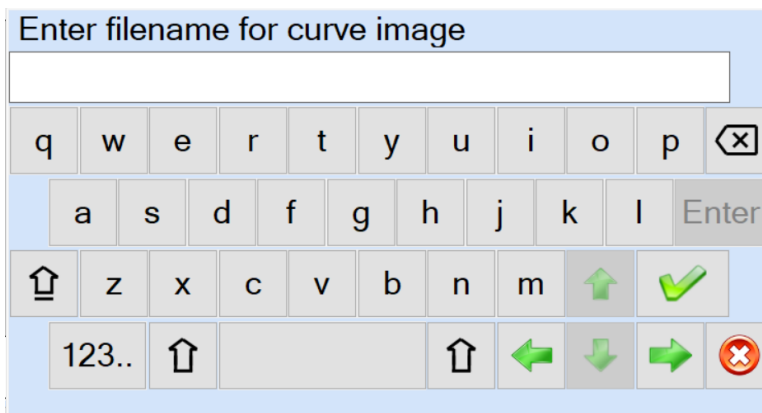
## 5.1 Export Learn or Run Curve

Assign filename and then is copied on the USB Key

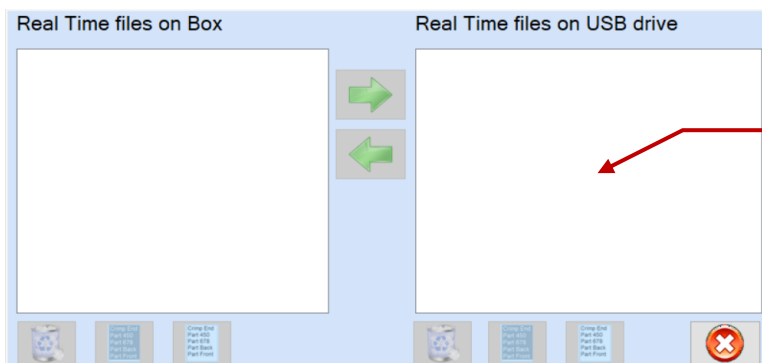


## 5.2 Save Screenshot

Export curve or screenshot

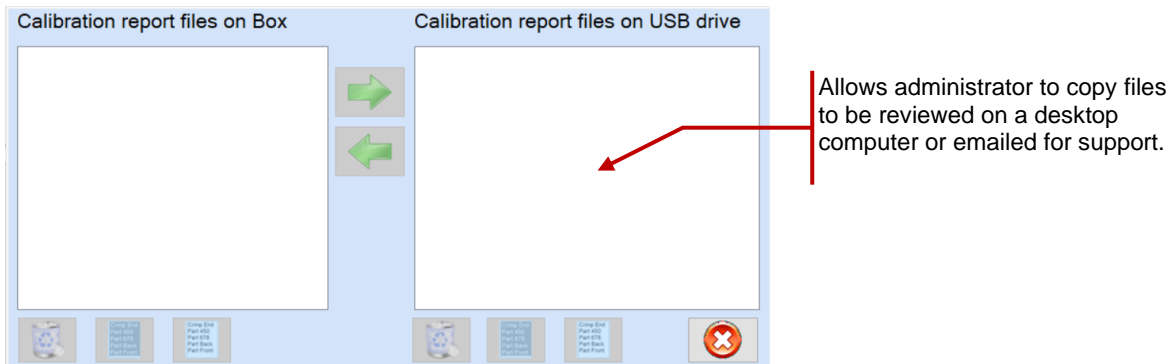


## 5.3 Manage Real-time files

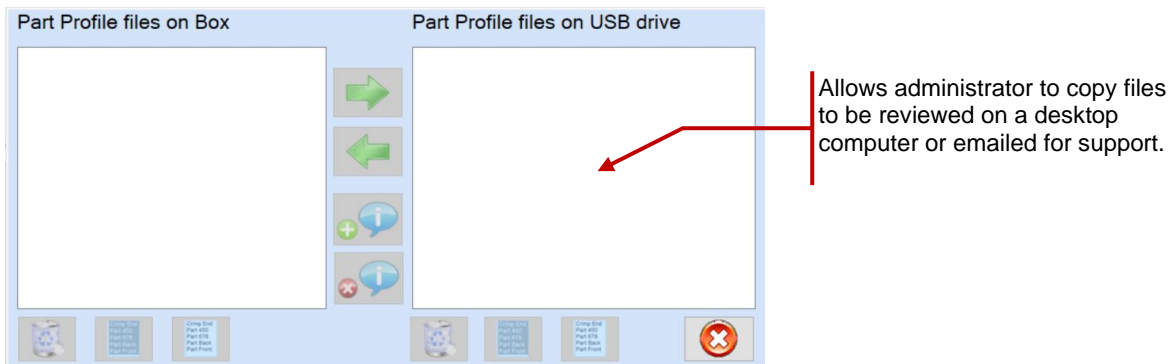


Allows administrator to copy Real-Time files to be reviewed on a desktop computer or emailed for support.

## 5.4 Manage Calibration



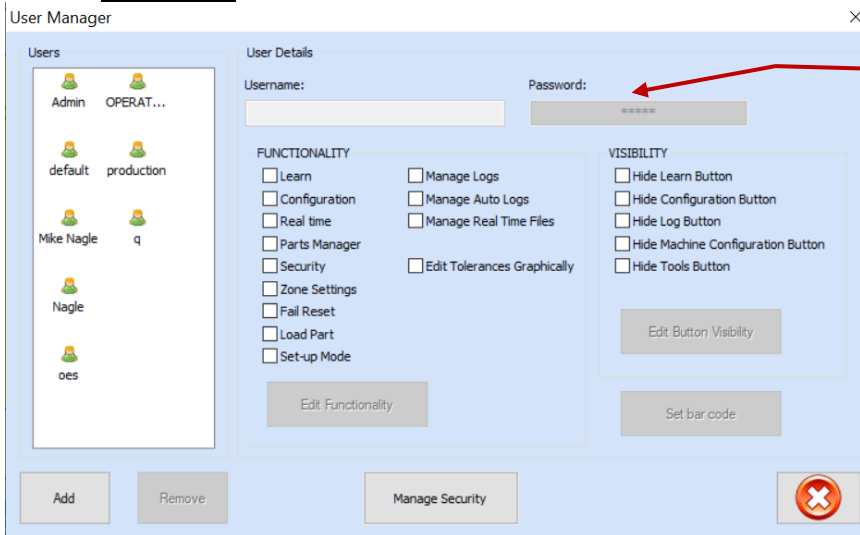
## 5.5 Manage Part Profiles



## 5.6 Manage I/O settings

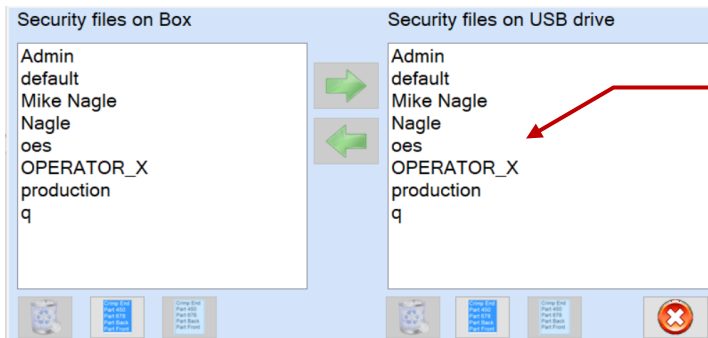


## 5.7 Security



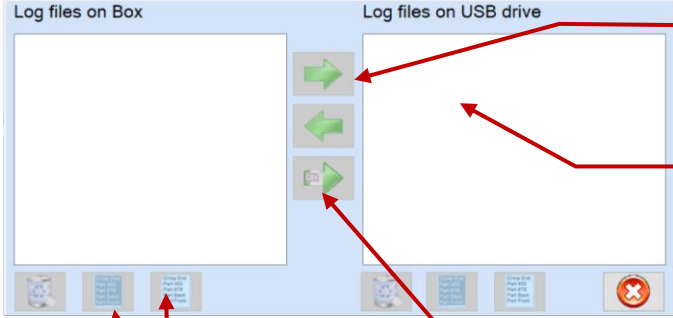
Allows administrator to create different levels of Users, each with an individual password and allowable functions. This can then be stored and transferred by the Manage Security function.

## Manage Security



Allows administrator to copy security User files from unit to unit

## 5.8 Manage User Log files



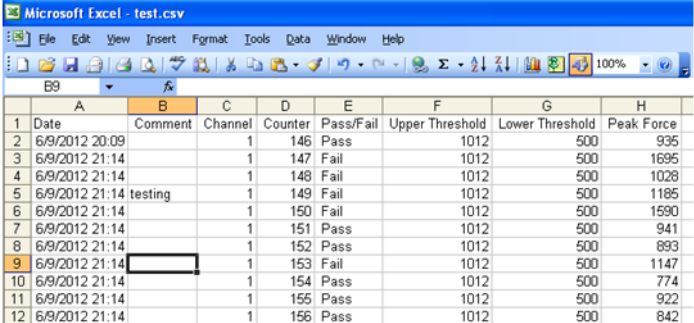
Select this ICON to copy Log files to the USB stick

Allows administrator to create CSV files to be exported or copy Log files to be reviewed on a desktop computer.

Select this ICON to export the file to CSV format and copy to the USB stick

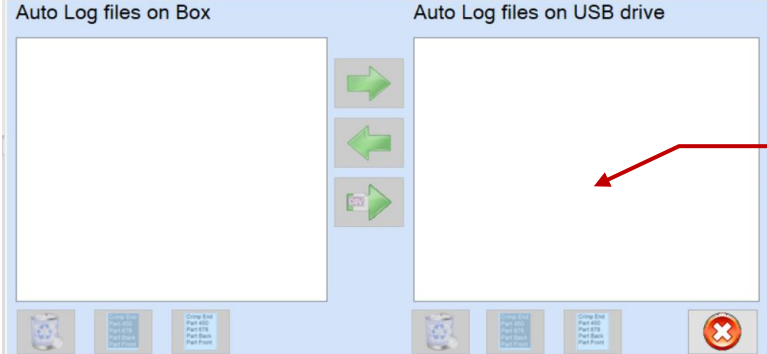
Select ALL from Unit

UN-Select ALL from Unit



	A	B	C	D	E	F	G	H
1	Date	Comment	Channel	Counter	Pass/Fail	Upper Threshold	Lower Threshold	Peak Force
2	6/9/2012 20:09		1	146	Pass	1012	500	935
3	6/9/2012 21:14		1	147	Fail	1012	500	1695
4	6/9/2012 21:14		1	148	Fail	1012	500	1028
5	6/9/2012 21:14	testing	1	149	Fail	1012	500	1185
6	6/9/2012 21:14		1	150	Fail	1012	500	1590
7	6/9/2012 21:14		1	151	Pass	1012	500	941
8	6/9/2012 21:14		1	152	Pass	1012	500	893
9	6/9/2012 21:14		1	153	Fail	1012	500	1147
10	6/9/2012 21:14		1	154	Pass	1012	500	774
11	6/9/2012 21:14		1	155	Pass	1012	500	922
12	6/9/2012 21:14		1	156	Pass	1012	500	842

## 5.9 Manage AutoLog files



The unit has an AutoLog feature which stores a complete AutoLog file per day. This file can be copied and reviewed.

## 5.10 Create OES Support File

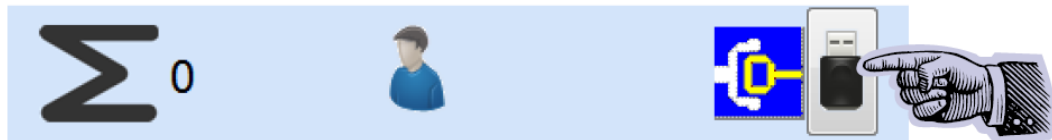
Used for advanced diagnosis functions only. When selected this creates and OES compressed file and copies to the USB stick. This file then can be emailed to OES.

1. Insert USB stick into the CPM5000

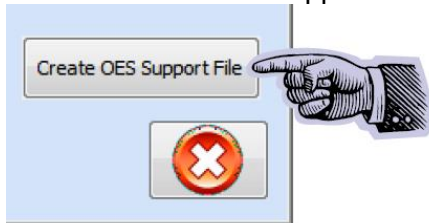




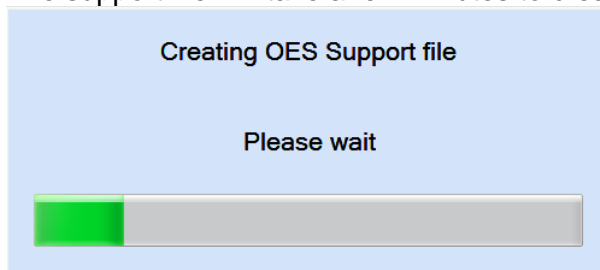
2. Press the USB icon in the lower right corner



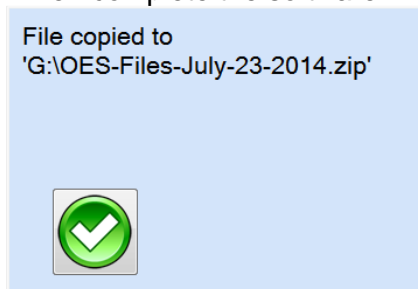
3. Select 'Create OES Support File'



4. The support file will take a few minutes to create

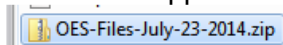


5. When complete the software will show the support file name



6. Remove the USB stick from the CPM5000.

7. Email the support file to OES



## 5.11 Create Default

Creates a default from the values currently set in configuration. Use the Advanced screen "Reset to Defaults" to then set the file in the unit.

## 5.12 Manage Default files

Allows administrator to copy the default files created and install on other units or be stored.

## 6.0 – Specifications

### 6.1 Configuration Worksheet

<i>Signature Learn</i>	<i>Default Setting</i>	<i>Custom Setting</i>
Max Learn Variation	3.0%	
Minimum Samples	5	
Maximum Samples	16	
Learn Authorization	None	
Stop after Learn	Disabled	
Learn timeout	300 seconds	
Target recalculation	5	
Recalculation Limit	75	
Process Deviation	2.0% (444.8N)	

<i>Sensor Configuration</i>	<i>Default Setting</i>	<i>Custom Setting</i>
Sensor	Strain (Non-Inverted)	
Display Units	N	
Range	22241	

<i>Signature Capture</i>	<i>Default Setting</i>	<i>Custom Setting</i>
Start Level	5.0% (1112N)	
Filter	5 ms	
Pre-Trigger	20 ms	
Duration	80 ms	
Alignment	20% Falling	

<i>Signature Analysis</i>	<i>Default Setting</i>	<i>Custom Setting</i>
CDA-L	125.0%	
R1	5.0%	
R2	30%	
R3	90%	
R4	90%	

<i>Outputs</i>	<i>Default Setting</i>	<i>Custom Setting</i>
<b>1</b>		
Channel	1	
Function	Fail	
NO / NC	NC	
Delay	NA	
Duration	NA	
Fail Reset	Keypad	
Chop Station	NA	
Chop on Start	Disabled	
Chop on Run	Disabled	
Chop on Learn	Disabled	
<b>2</b>		
Channel	1	
Function	Pass	
NO / NC	NO	
Delay	0 ms	
Duration	250 ms	
Fail Reset	NA	
Chop Station	NA	
Chop on Start	Disabled	
Chop on Run	Disabled	
Chop on Learn	Disabled	
<b>3</b>		
Channel	NA	
Function	Disabled	
NO / NC	Disabled	
Delay	Disabled	
Duration	Disabled	
Fail Reset	Disabled	
Chop Station	Disabled	
Chop on Start	Disabled	
Chop on Run	Disabled	
Chop on Learn	Disabled	

<i>Outputs</i>	<i>Default Setting</i>	<i>Custom Setting</i>
<b>4</b>		
Channel	1	
Function	Fail	
NO / NC	NC	
Delay	NA	
Duration	NA	
Fail Reset	Keypad	
Chop Station	NA	
Chop on Start	Disabled	
Chop on Run	Disabled	
Chop on Learn	Disabled	
<b>5</b>		
Channel	1	
Function	Pass	
NO / NC	NO	
Delay	0 ms	
Duration	250 ms	
Fail Reset	NA	
Chop Station	NA	
Chop on Start	Disabled	
Chop on Run	Disabled	
Chop on Learn	Disabled	
<b>6</b>		
Channel	NA	
Function	Disabled	
NO / NC	Disabled	
Delay	Disabled	
Duration	Disabled	
Fail Reset	Disabled	
Chop Station	Disabled	
Chop on Start	Disabled	
Chop on Run	Disabled	
Chop on Learn	Disabled	




<i>Inputs</i>	<i>Default Setting</i>	<i>Custom Setting</i>
<b>Input 1</b>		
Function	Disabled	
Sig	NA	
Logic	NA	
Timeout	NA	
<b>Input 2</b>		
Function	Disabled	
Sig	NA	
Logic	NA	
Timeout	NA	
<b>Input 3</b>		
Function	Disabled	
Sig	NA	
Logic	NA	
Timeout	NA	
<b>Input 4</b>		
Function	Disabled	
Sig	NA	
Logic	NA	
Timeout	NA	

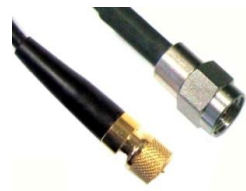


## 6.2 Specifications

<b>Supply Voltage</b>	100 – 240 VAC (50-60Hz)
<b>Power supply</b>	24VDC @ 1.67A
<b>Communications</b>	1 x Ethernet RJ45 2 x RS232 2 x USB 2.0 (expandable)
<b>Sensor Inputs</b>	2
<b>Digital Inputs</b>	4 Inputs @ 24VDC
<b>Digital Outputs</b>	2 Solid State outputs @500mA/24VDC 2 Relay outputs @ 1A/30VDC 2 Relay outputs @ 2A/240VAC-2A/30VDC
<b>Display</b>	7" colour touch screen
<b>Dimensions</b>	185 x 198 x 70 mm (7.28 x 7.80 x 2.75 inches)

### 6.3 Spare Parts and Options

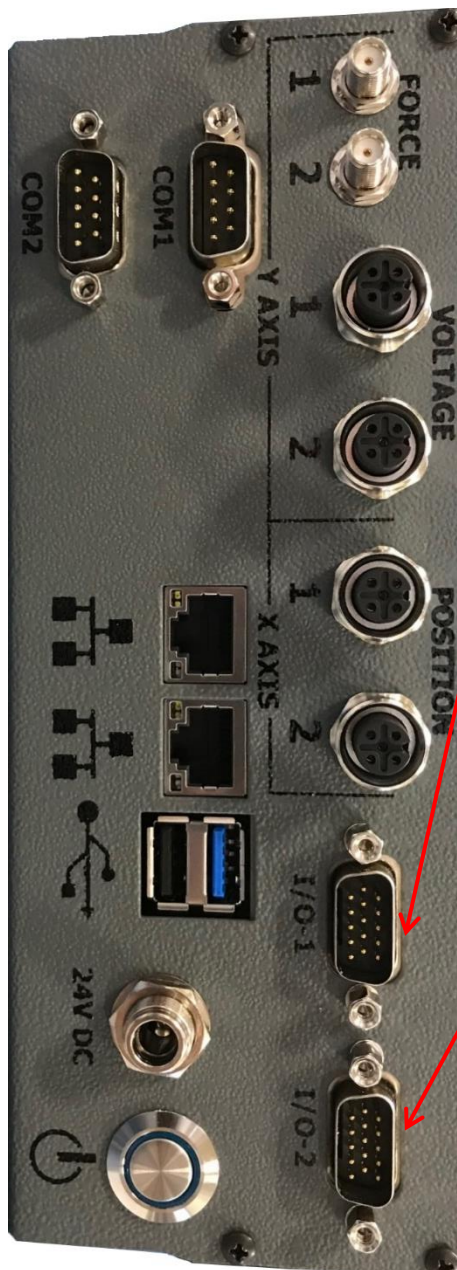
Spare parts	Part number
Mounting Bracket	EN014G 
Software supplied in USB	LB080A 
<b>Power Cord Options</b>	
North American	HW179B+ 
European	HW179G+ 
Japanese	HW179B+ with HW179F+ 
Chinese	HW179E+ 
Indian	HW179H+ 
<b>Interface cable</b>	
Standard Interface cable -15 pin to flying leads	AU802A 

Sensor Options	Part Number
<b>Strain Sensor</b> - 40mv/ms sensitivity	AU011G 
<b>Force Transducer</b> Ram Mounted - 5000lb (202M23) Base plate mounted - Low profile 5000lb (201M83) Base plate mounted - 5000 lb (201M83)	AU017A  AU016C AU016D
<b>SenFit PBT Ram Sensors</b>  The OES SenFit PBT Sensor is designed for many various models of presses. Please contact your OES sales representative for part number information.	PBT-XXXX 

Sensor Cable Options	Part Number
SMA Male to 10/32 Male - 1 meter	AU103E+ 
SMA Male to SMB Female - 1 meter	AU103A+ 
<b>Extension Cable</b>  SMA Male - SMA Female - 2 meter SMA Male - SMA Female - 3 meter SMA Male - SMA Female - 4 meter	AU103B+  AU103C+ AU103D+



## Appendix: CPM5000 Field Wiring-24VDC Discrete I/O



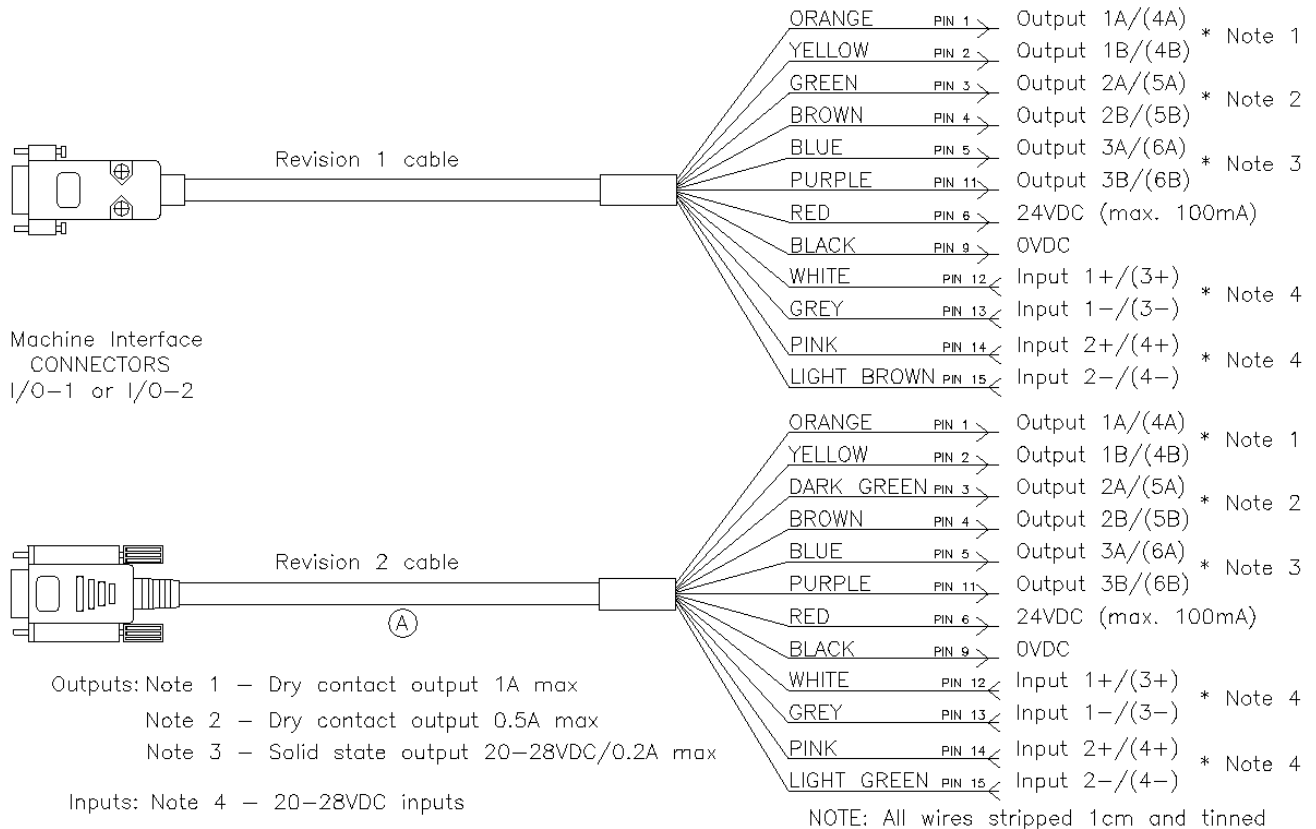
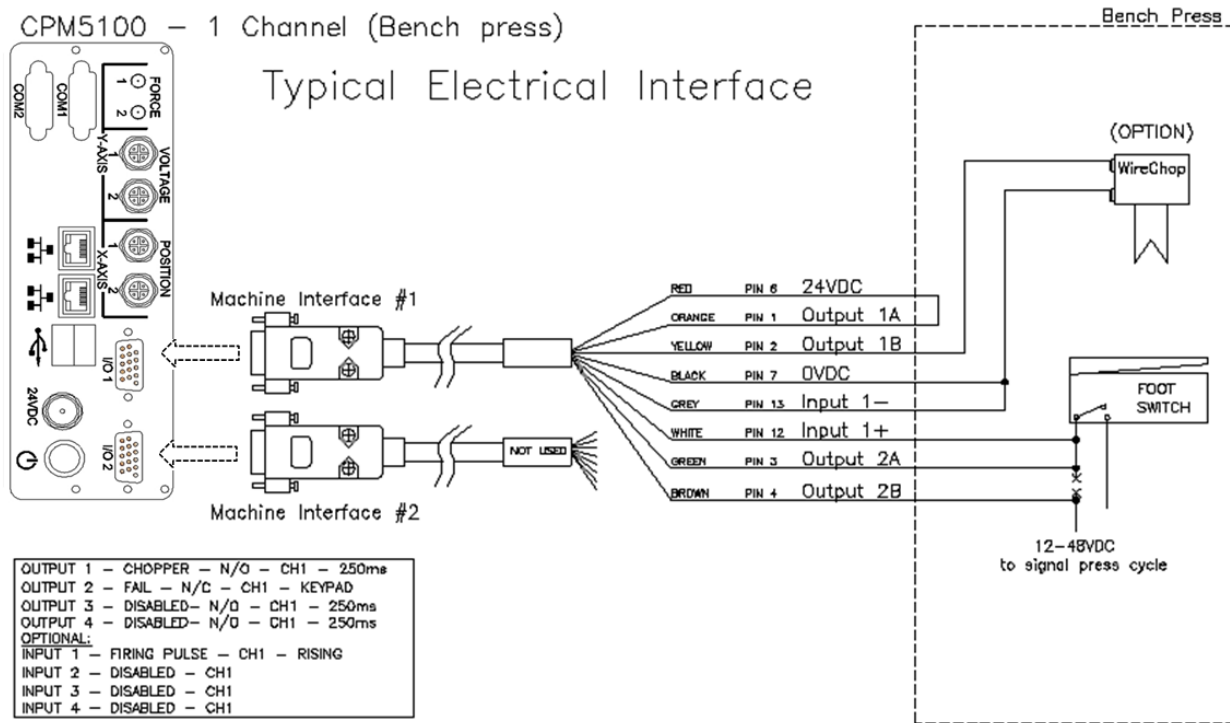
COLOUR	FUNCTION	PIN
Orange	Output 1A	1
Yellow	Output 1B	2
Dark Green	Output 2A	3
Brown	Output 2B	4
Blue	Output 3A	5
Purple	Output 3B	11
White	Input 1 +	12
Grey	Input 1 -	13
Pink	Input 2 +	14
Light Green	Input 2 -	15
Red	24Vdc (100ma max.)	6, 10
Black	0Vdc	7, 8, 9

COLOUR	FUNCTION	PIN
Orange	Output 4A	1
Yellow	Output 4B	2
Dark Green	Output 5A	3
Brown	Output 5B	4
Blue	Output 6A	5
Purple	Output 6B	11
White	Input 3 +	12
Grey	Input 3 -	13
Pink	Input 4 +	14
Light Green	Input 4 -	15
Red	24Vdc (100ma max.)	6, 10
Black	0Vdc	7, 8, 9

## Appendix: CPM5000 Field Wiring-Bench Press Diagram

CPM5100 – 1 Channel (Bench press)

### Typical Electrical Interface





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