

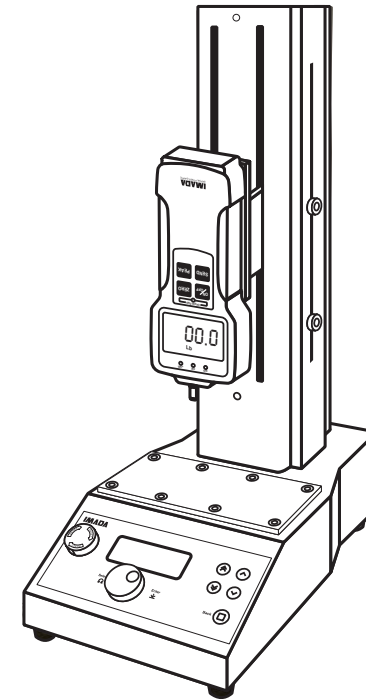
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Imada, Inc. warrants its products to the original purchaser to be free from defects in workmanship and material under normal use and proper maintenance for two years (one year for adapters, attachments, and cables) from original purchase. This warranty only covers defective material and labor and does not cover calibration, batteries, freight, fees and expenses and shall not be effective if the product has been subject to overload, shock load, misuse, negligence, accident or repairs attempted by others than Imada, Inc.

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.

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# **VERTICAL MOTORIZED TEST STAND**



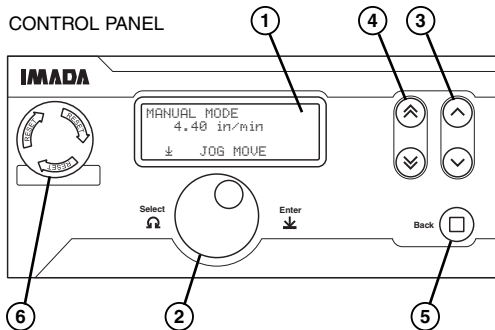
## **Models: MX2-110 & MX2-275 INSTRUCTION MANUAL**

## INTRODUCTION

The MX2 Vertical Motorized Test Stand uses a maintenance-free, brushless, DC motor to provide smooth and powerful operation and ensure consistent test results. Automated fatigue tests are easy to setup using the unique program dial and menu screens to control speed, timer and cycle count. Force controlled non-destructive tests are also easy to setup and program. Manual mode features unique movement control in precise increments, for precision testing.

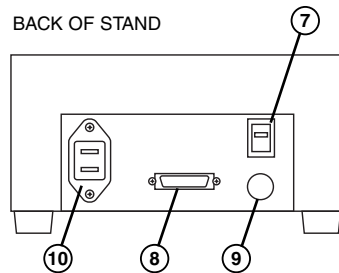
## SPECIFICATIONS

Model	MX2-110	MX2-275
Max Load	110 lbf	275 lbf
Standard Speed	.4~12 in/min (10~305 mm/min)	.4~12 in/min (10~305 mm/min)
Optional Fast Speed	.8~23.5 in/min (20~600 mm/min)	.9~23.5 in/min (20~600 mm/min)
Optional Slow Speed	.1~3.5 in/min (3~90 mm/min)	.1~2.9 in/min (2~75 mm/min)
Stroke	9.44" (240mm)	11.6" (295mm)
Deflection	.5 mm at maximum load	.5 mm at maximum load
Power	115/230 VAC	115/230 VAC



### CONTROL PANEL

- ① LCD screen
- ② Program Dial
- ③ Single Speed Button
- ④ Double Speed Button
- ⑤ Back Button (Mode)
- ⑥ Emergency Stop/Reset

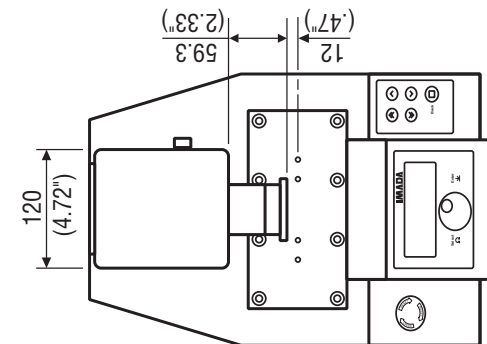
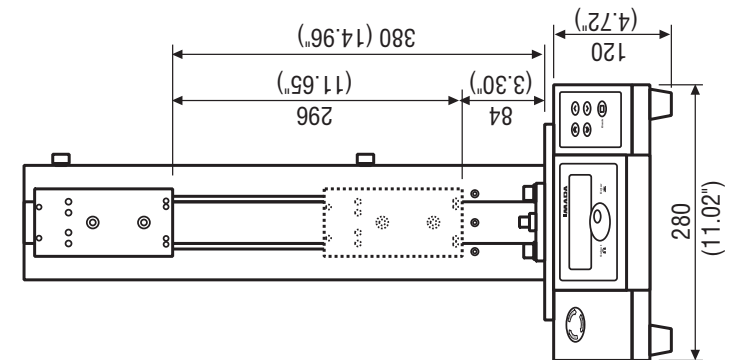
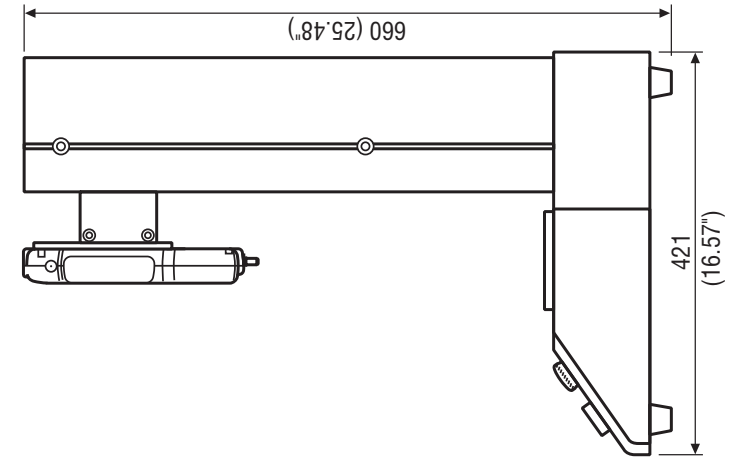


### BACK OF STAND

- ⑦ Power Switch
- ⑧ Force Control port
- ⑨ Fuse
- ⑩ AC Power

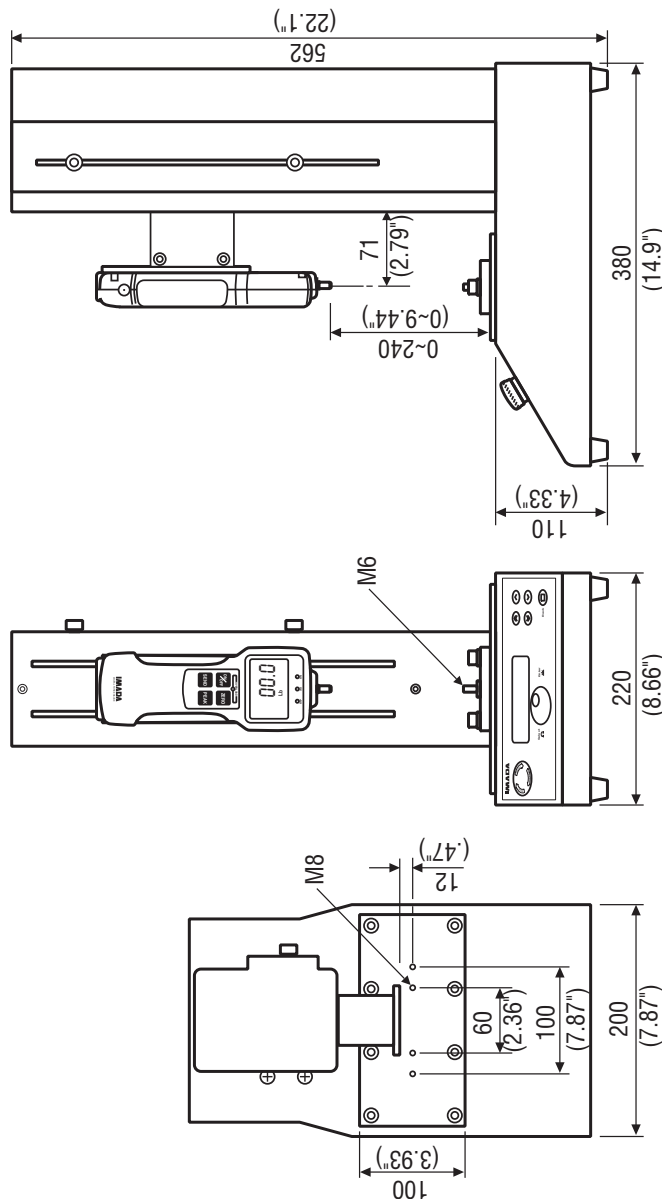
## DIMENSIONS

### MX2-275



## DIMENSIONS

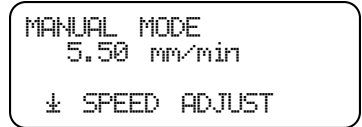
### MX2-110



## Check the following before testing

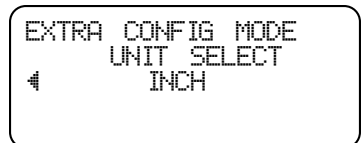
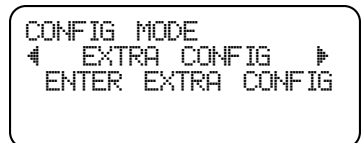
1. Turn the **Emergency Stop** ⑥ clockwise to make sure it is released. Press it whenever you are in an emergency situation.
2. Move the **Upper and Lower Travel Limits** so that there is separation between them or the cross head will not move and a limit error is displayed on the LCD screen (see page 5).
3. Connect the power cord to the proper AC power.
4. Turn on power switch ⑦ on the back of the test stand.

When the power is turned on Manual Mode/Speed Adjust is the startup screen. The default speed unit is mm/min.



## Changing Speed Units

1. Press the Back button ⑤ to change to Cycle Mode.
2. Press and hold the dial until the Config Mode screen appears.
3. Turn the dial until Extra Config appears (arrows ◀ ▶ indicate current selection).
4. Press the dial to enter Extra Config Mode.
5. Turn the dial in Extra Config Mode until Unit Select appears.
6. Press the dial to enter.
7. Turn the dial to select inch or millimeter.
8. Press the Back button ② twice to exit Extra Config Mode and return to Cycle Mode. Unit selection is then retained in memory for future tests.



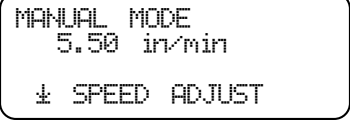
## MANUAL MODE

Manual Mode/Jog Move is used mainly to position the cross head prior to testing and for precise increment testing.

When power is turned on, Manual Mode/Speed Adjust is the startup screen. There are two menu items in the Manual Mode, Speed Adjust and Jog Move. Press the program dial to toggle the menu items.

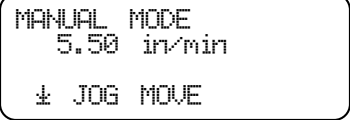
### Speed Adjust

Speed Adjust is displayed at the bottom of the screen. Turn the program dial to set the speed.



### Jog Move

Jog Move is displayed at the bottom of the screen. Turn the dial to make precise adjustments to the cross head for positioning and testing.



Each click of the dial moves the cross head (standard speed, under no load) approximately .015mm for MX2-110 and .01mm for MX2-275.

All the up and down speed buttons work in Jog Move.

### Manual Mode Operation

Press and hold ⤴, and the cross head moves up at the speed set in Speed Adjust, stopping when it reaches the upper travel limit. Press and hold ⤵ and the cross head moves down, stopping when it reaches the lower travel limit. The cross head stops when either button is released.

Press and hold ⤴ and the cross head moves up at maximum speed (displayed on the screen) stopping when it reaches the upper travel limit. Press and hold ⤵ and the cross head moves down, stopping when it reaches the lower travel limit. The cross head stops when either button is released.

### Jog Move Operation

Use Jog Move to test or position by turning the dial to move the gauge and attachment in precise increments.

## OPTIONAL DISTANCE METER

Available for mounting to test stand.

Distance Meter Specifications	
Display	Push button for inch/mm, zero set and on/off
Resolution	0.0005"/0.01mm
Accuracy	0.1% of reading or 0.005"/0.1mm, whichever is greater

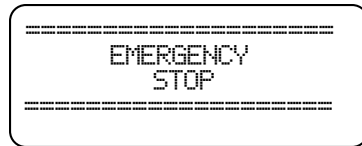
### - WARNING -

1. Test samples can break or shatter, wear eye and body protection to avoid injury.
2. Do not exceed the capacity of the test stand. Be sure to set the upper and lower travel limits to avoid overload.

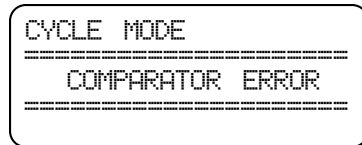
## TROUBLESHOOTING

### Error Screens

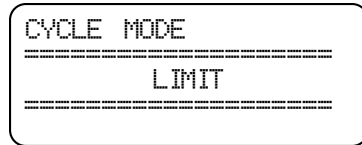
**Emergency Stop**– These first two screens will display alternately. Turn the Reset switch clockwise



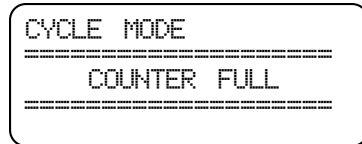
**Comparator Error**– Make sure Comparator menu item in Extra Config is set to OFF, unless force control is setup, then comparator must be ON.



**Limit**– The travel limit has been reached. Adjust the travel limit to allow more space or move in the opposite direction



**Counter Full**– Select Cycle Mode and press the program dial to clear the counter.



### RESET FROM OVERLOAD

If the test stand overloads or locks up during testing, turn off both test stand and force gauge. Then turn on the test stand and using the direction switch, back off the cross head (in the opposite direction from the overload) to release the load.

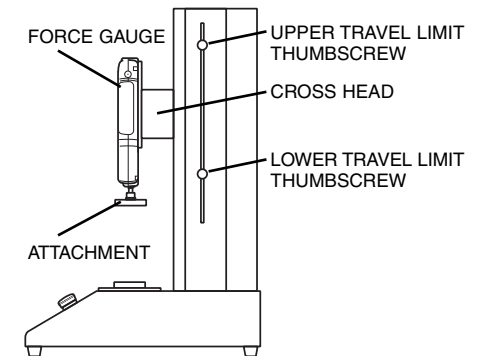
### EMERGENCY BRAKE STOP SWITCH

Push the **Emergency Stop** Ⓞ whenever you are in an emergency situation. Turn the switch clockwise to release.

## SETTING TRAVEL LIMITS

### For a compression test

loosen the upper travel limit thumbscrew and move it to the top. Press and hold Ⓢ to move the force gauge and attachment up until there is adequate clearance for testing. Then move the upper travel limit down to this position and tighten securely. Loosen



and move the lower travel limit to the bottom. \*Press and hold Ⓢ to move the gauge and attachment and stop when they reach the test material. The distance travelled during compression must be added to determine the position of the lower travel limit. *Be careful, the force gauge can be overloaded whether on or off.* Press and hold Ⓢ or use Jog Move to move the gauge and attachment to the desired position. Move the lower travel limit to this position and tighten securely.

**For a tension test** loosen the lower travel limit thumbscrew and move it to the bottom. \*Press and hold Ⓢ and move the force gauge and attachment down and stop when they reach the test material. Press and hold Ⓢ or use Jog Move to engage the test material. *Be careful, the force gauge can be overloaded whether on or off.* Move the lower travel limit to this position and tighten securely. Press and hold Ⓢ to move the force gauge and attachment up to allow adequate clearance for testing. Move the upper travel limit to this position and tighten securely.

**\*CAUTION:** Set the lower travel limit to allow adequate clearance for the *gauge and attachments*, so they do not crash into the test material. To prevent accidental movement of the lower limit position, replace the thumbscrew with an M4 Allen screw so an Allen wrench will be required to adjust it.

## CYCLE MODE

Cycle Mode is used for automated single or multiple cycle tests such as fatigue testing.

Turn on the stand and press Back button **Ⓢ** to enter Cycle mode. The Cycle Mode main screen displays as below.

STATUS INDICATOR

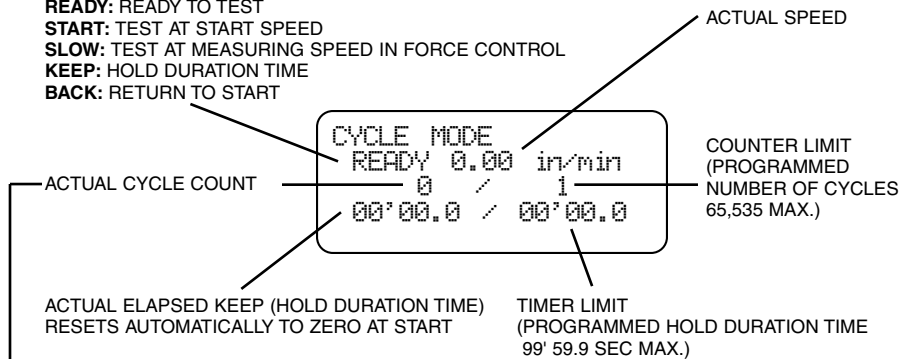
**READY:** READY TO TEST

**START:** TEST AT START SPEED

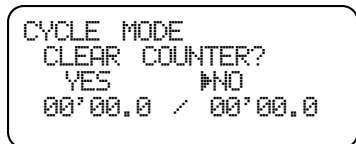
**SLOW:** TEST AT MEASURING SPEED IN FORCE CONTROL

**KEEP:** HOLD DURATION TIME

**BACK:** RETURN TO START



To reset the actual cycle count press the dial and turn it to select Yes or No and press the dial to confirm (not possible if count is zero).



## Programming Cycle Mode

### Config Mode Menu

1. In Cycle Mode, press and hold the program dial until Config Mode appears.
2. Turn the dial to view menu items and press the dial to select a menu item (the arrows **◀ ▶** indicate the current selection).
3. Turn the dial to make adjustments or select options for that item.
4. Press the dial again to confirm and return to menu items.
5. Press the Back button **Ⓢ** to exit Config Mode and return to Cycle Mode. Selections are then saved in memory.

## Force Control Operation

### Maintain Force Between High/Low Setpoints

Press either single arrow button **⬆** or **⬇** and the cross head moves at Start Speed, stops at the low setpoint on the Z Series force gauge and Keeps (holds) applied force between the force gauge's high/low setpoints for the programmed Timer Limit using Measuring Speed and then moves to starting travel limit at Return Speed. The cycle is repeated until the Counter Limit is reached.

### Increase Force to High Setpoint and Stop

Using the same programming setup, press either double arrow **⬆⬇** or **⬇⬆** and the cross head moves at Start Speed and slows to Measuring Speed at the low setpoint on the Z Series force gauge. When the applied force reaches the gauge's high setpoint movement stops and the position is held for the programmed Timer Limit. The cross head then moves back to the starting travel limit at Return Speed. This cycle is repeated until the Counter Limit is reached.

### Conditional Overload Prevention

When a Z Series force gauge is mounted and connected to an MX2 stand with a CB-704 or CB-707 cable, Conditional Overload Prevention engages at 110% of gauge capacity and stops test stand movement. Depending upon test speed and other variables, movement may be stopped quickly enough to prevent damage to the gauge in most cases, but due to the wide variety of testing conditions a guarantee is not possible.

**Output Test**– Factory use only

```
EXTRA CONFIG MODE
◀ OUTPUT TEST ▶
```

**Send Signal**– Sends one data to gauge memory at Keep (hold) point requires CB-704 cable. Saving data to computer and gauge memory requires CB-707 cable.

```
EXTRA CONFIG MODE
◀ SEND SIGNAL ▶
OFF
```

**Unit Select**– inch or millimeter

```
EXTRA CONFIG MODE
UNIT SELECT
◀ INCH ▶
```

**Clear All Config**– Yes/No Returns to factory setup

```
EXTRA CONFIG MODE
◀ CLEAR ALL CONFIG ▶
YES NO
```

Press the Back button  $\text{\textcircled{B}}$  twice to return to Cycle mode. Selections are then saved in memory.

### TIP: Programming Z Series Force Gauge High/Low Setpoints

For further instructions refer to the Z Series manual.

1. Turn on the gauge. Press PEAK and ZERO for 3 seconds to enter Power-On programming (CF9 flashes with solid F0).
2. Press PEAK or ZERO to view the selections. Select CF9 F1 and press SEND.
3. -HI- displays, then the high set value (i.e. H 10.0). Press PEAK to increase and ZERO to decrease, press SEND to select. -LO- displays then the low set value (i.e. L 5.0). Press PEAK to increase and ZERO to decrease, press SEND to select, CF9 End displays. Press SEND again to exit.

```
HI 10.0
Lbf
```

```
L 5.0
Lbf
```

**Start Speed**– the cross head advances toward the travel limit at this speed

```
CONFIG MODE
◀ START SPEED ▶
7.00 in/min
```

**Measuring Speed**– skip this item in Cycle Mode

```
CONFIG MODE
◀ MEASURING SPEED ▶
1.50 in/min
```

**Extra Config**– skip this item in Cycle Mode

```
CONFIG MODE
◀ EXTRA CONFIG ▶
ENTER EXTRA CONFIG
```

**Return Speed**– the cross head returns to the starting travel limit at this speed

```
CONFIG MODE
◀ RETURN SPEED ▶
11.50 in/min
```

**Timer Limit**– Keep (hold time duration) 99' 59.9 seconds max., default is 1 second

```
CONFIG MODE
◀ TIMER LIMIT ▶
00'00.8
```

**Counter Limit**– counts up to 65,535 cycles max., default is 1 cycle,  $\infty$  = continuous cycle, doesn't stop

```
CONFIG MODE
◀ COUNTER LIMIT ▶
∞
```

Press the Back button  $\text{\textcircled{B}}$  to exit Config Mode and return to Cycle Mode. Selections are then saved in memory.

### Cycle Mode Operation

Press a direction button  $\text{\textcircled{^}}$ ,  $\text{\textcircled{v}}$ ,  $\text{\textcircled{R}}$  or  $\text{\textcircled{D}}$  and the cross head moves at Start Speed, stops for the programmed Timer Limit at the travel limit, then returns to the opposite travel limit at the programmed Return Speed. The cycle is repeated until the Counter Limit is reached.






## FORCE CONTROL MODE

Force Control Mode is used for automated single or multiple cycle non-destructive tests. The stand must be connected to a Imada Z Series force gauge with a CB-704 or CB-707 cable. The following menu items must be set; speeds, timer limit, counter limit and comparator set to On. Z Series force gauge high/low setpoints must be also programmed.

### Programming Force Control Mode

#### Config Mode Menu

1. Turn on the stand and press Back button  to enter Cycle Mode.
2. Press and hold the program dial until Config Mode appears.
3. Turn the dial to view menu items and press the dial to select a menu item (the arrows   indicate the current selection).
4. Turn the dial to make adjustments to that item or select options.
5. Press the dial again to confirm and return to menu items.

**Start Speed-** the cross head advances toward the travel limit at this speed

```
CONFIG MODE
< START SPEED
  7.00 in/min
```

**Measuring Speed-** engages in force control mode when applied force reaches the low setpoint on the Z Series force gauge. Measuring speed cannot exceed Start Speed


```
CONFIG MODE
< MEASURING SPEED >
  1.90 in/min
```

**Return Speed-** the cross head returns to the starting travel limit at this speed

```
CONFIG MODE
< RETURN SPEED >
  11.50 in/min
```

**Timer Limit-** Keep (hold time duration) 99' 59.9 seconds max., default is 1 second




```
CONFIG MODE
< TIMER LIMIT >
  00'00.8
```

**Counter Limit-** counts up to 65,535 cycles max., default is 1 cycle,  = continuous cycle, doesn't stop

```
CONFIG MODE
< COUNTER LIMIT >
  ∞
```

## Programming Force Control Mode (cont'd)

### Extra Config Mode Menu

5. Turn the dial until Extra Config appears on the screen.
6. Press the dial to enter Extra Config Mode.
7. Turn the dial to view menu items and press the dial to select a menu item (the arrows   indicate the current selection).
8. Turn the dial to make adjustments to that item or select options.
9. Press the dial again to confirm and return to menu items.
10. Press the Back button  twice to exit Extra Config Mode and return to Cycle Mode. Unit selection is then retained in memory for future tests.

```
CONFIG MODE
< EXTRA CONFIG >
ENTER EXTRA CONFIG
```

**Buzzer On Count Up-** ON or OFF beeps when programmed number of cycles is completed.

```
EXTRA CONFIG MODE
<BUZZER ON COUNT UP>
  ON
```

**Comparator-** ON or OFF On for force control; test stand and force gauge must be connected with CB-704 or CB-707 cable or screen will display "Comparator Error" on startup

```
EXTRA CONFIG MODE
< COMPARATOR >
  ON
```

**Record Trigger-** OFF (Factory use only)

```
EXTRA CONFIG MODE
< RECORD TRIGGER >
  OFF
```

**Zero On Start-** ON or OFF Tares the gauge before starting

```
EXTRA CONFIG MODE
< ZERO ON START >
  OFF
```

**Input Monitor-** Factory use only

```
EXTRA CONFIG MODE
< INPUT MONITOR >
```