APM DECORATOR
HIGH SPEED LOGIC MODULE
KEYPAD QUICK REFERENCE

Systems Engineering Associates, Inc.
14989 West 69th Avenue
Arvada, Colorado 80007 U.S.A.
Telephone: (303) 421-0484
Fax: (303) 421-8108

APM DECORATOR
HIGH SPEED LOGIC MODULE
KEYPAD QUICK REFERENCE

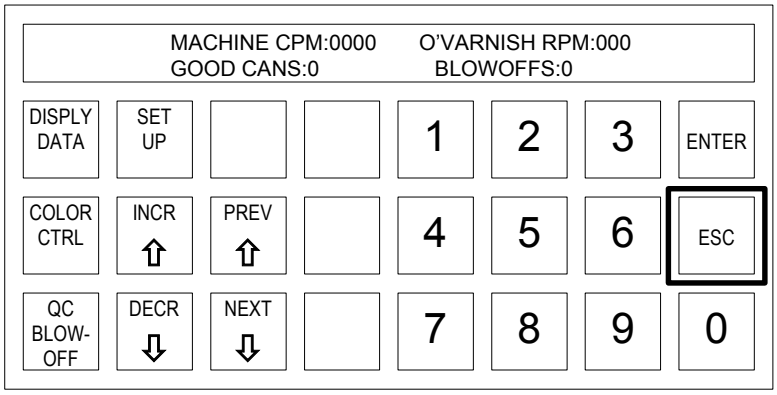
CONTENTS

CONVENTIONS USED IN THIS MANUAL

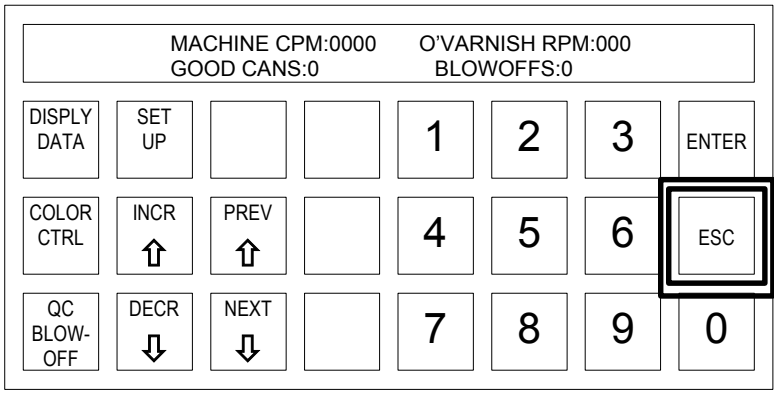
This manual is provided as a quick reference for entering parameters through the APMDEC keypad. For complete details on the parameters that can be set through the APMDEC keypad or for additional information on the APMDEC in general, refer to the APM Decorator Control System Manual.

The following conventions are used through-out this manual.

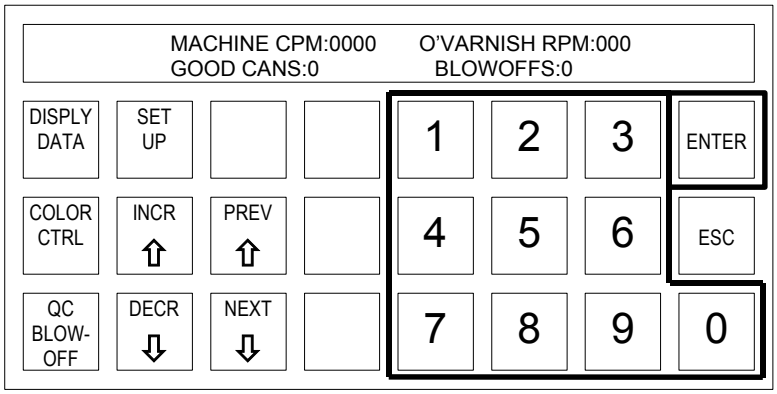
1) This indicates to depress that key one time.



2) This indicates to press that key two or more times as directed.



3) Indicates to enter a numeric value on the numeric keypad. Enter the desired number by depressing the corresponding numeric keys and then press the "ENTER" key to enter the number. If keypad entry error is made while a number is being entered, simply press the "ESC" key. The number will revert back to the original value at which time the correct number can be re-entered.

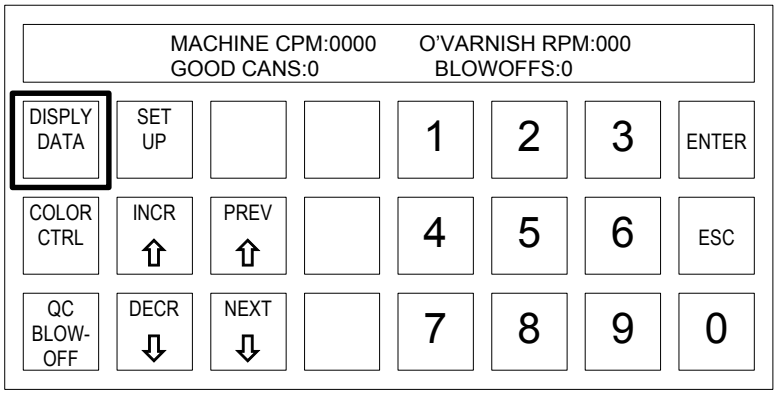


SECTION 1
DATA DISPLAY

The Data Display menu is used to display the "Trips per Spindle" data, "Current Shift" data, "Last Shift" data and "Lifetime" good can count. When selected, brings up a listing of sub-menu selections to display collected data.

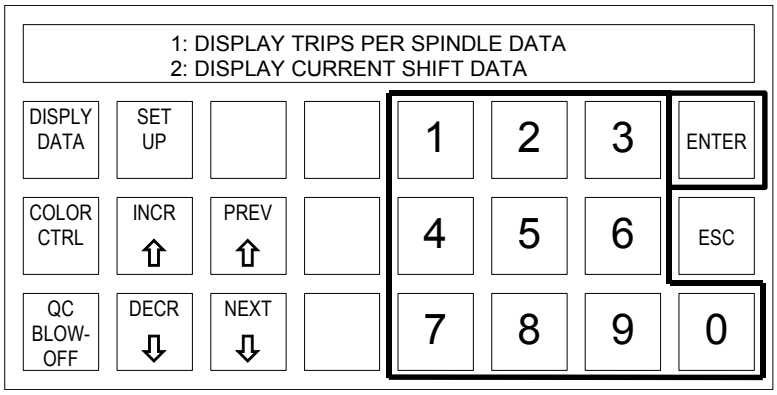
To display the "Display Data" menu selections perform the following:

1) With the "Main Menu" displayed, press the "DISPLAY DATA" key.



2) Using the numeric keypad, enter 1-4 to display the following selections:

   1: Display Trips per Spindle Data
   2: Display Current Shift Data
   3: Display Last Shift Data
   4: Display Lifetime Can Count

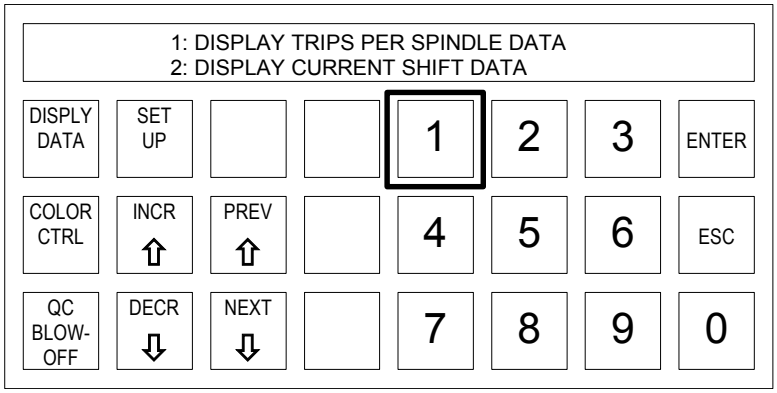


SECTION 1.1
VIEWING TRIPS PER SPINDLE DATA

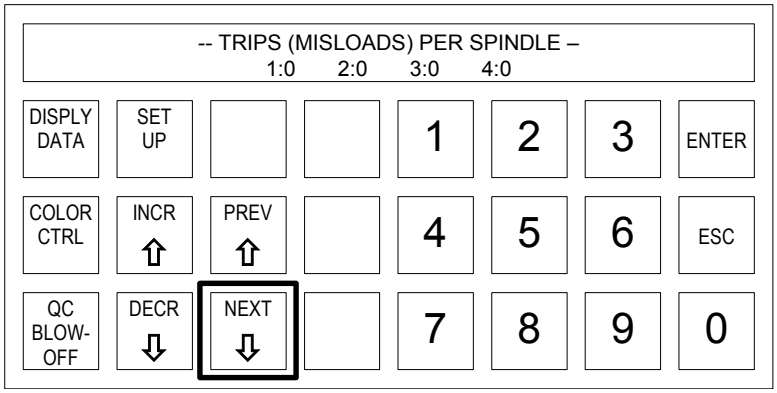
The Trips per Spindle data menu displays the total number of trips for each spindle since the last reset or end of shift. The Number of trips per spindle data menu is provided to aid in the trouble-shooting of a loading problem with a spindle or spindles. The operator can reset these counts at any time to aid in the trouble-shooting process.

To display the "Trips per Spindle" data, perform the following:

1) With the main "Data Display" menu displayed, press the "1" key.

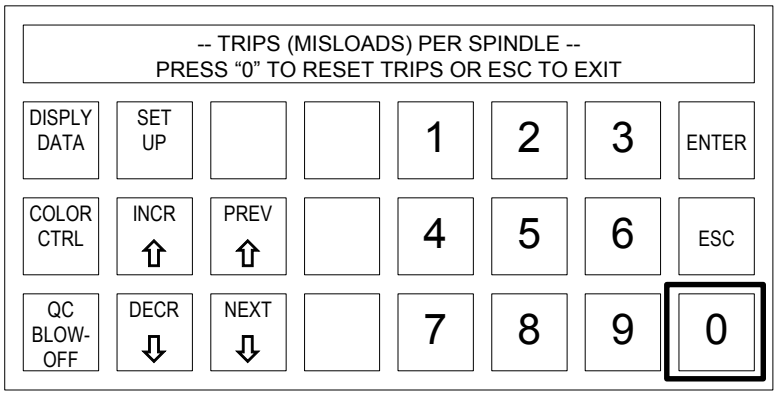


2) The trips (mis-loads) per spindle counts for the first four stations are displayed. The data is arranged with 4 stations shown on each screen. Press the "NEXT" key to advance through all stations or the "PREV" key to retard back to previous stations.



3) The final screen of this menu, prompts the user to reset the counts. Press the "0" key to reset the counts or the "ESC" key to return to the main menu.

   Note: The "ESC" key can be used at any time to abort the "Trips per Spindle" data menu and return to the main menu.



SECTION 1.2
VIEWING CURRENT SHIFT DATA

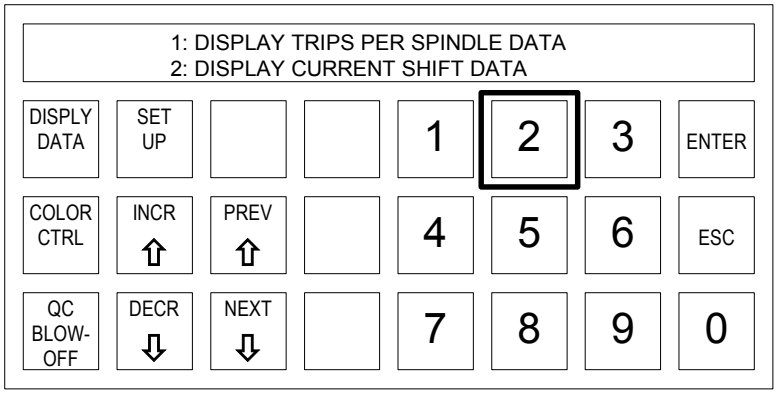
The Current Shift data menu displays the following data accumulated so far into the current shift:

- o Total Number of "Mis-Loads" or Bad Can Blow-offs
- o Total Number of "Restart Blow-offs"
- o Total Number of "Manual Blow-offs"
- o Total Number of "QC Blow-offs"
- o Total "Trips (Mis-loads) per Spindle"

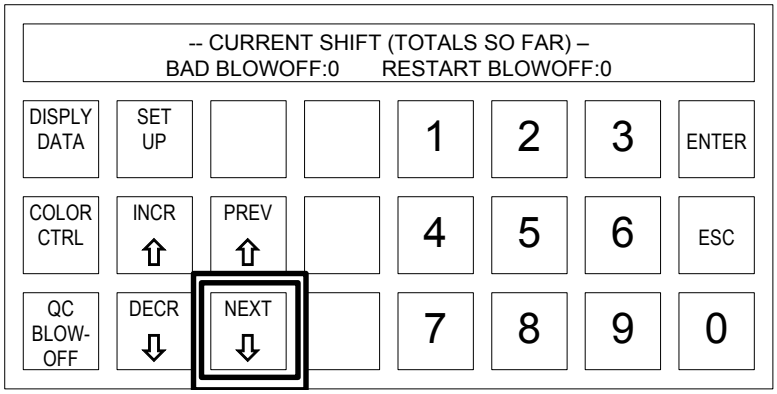
Note: The current shift total "Good Can" count and total "Blow-off" count are displayed as part of the main display.

To display the "Current Shift" data, perform the following:

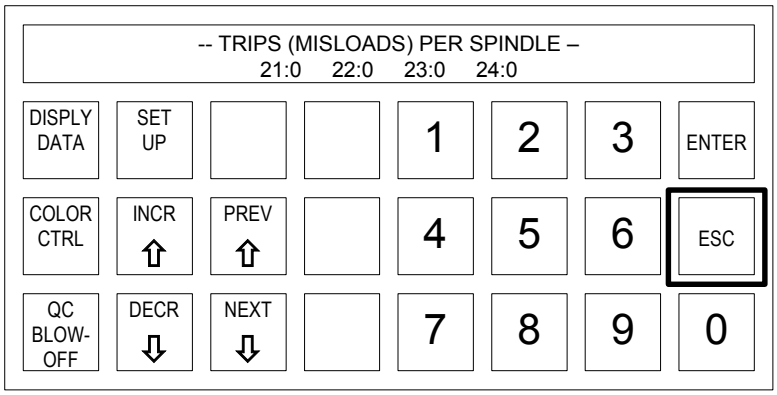
1) With the main "Data Display" menu displayed, press the "2" key.



2) The number of "Bad Blow-offs" and the number of "Restart Blow-offs" are displayed on the first screen. Press the "NEXT" key to display the current number of "Manual Blow-offs" and "QC Blow-offs". Continue to press the "NEXT" key to view the "Trips (misloads) Per Spindle" counts. Press the "PREV" key to retard back to the previous data display.



3) Once all data displays have been observed, press the "ESC" key to return to the main "Data Display" menu.



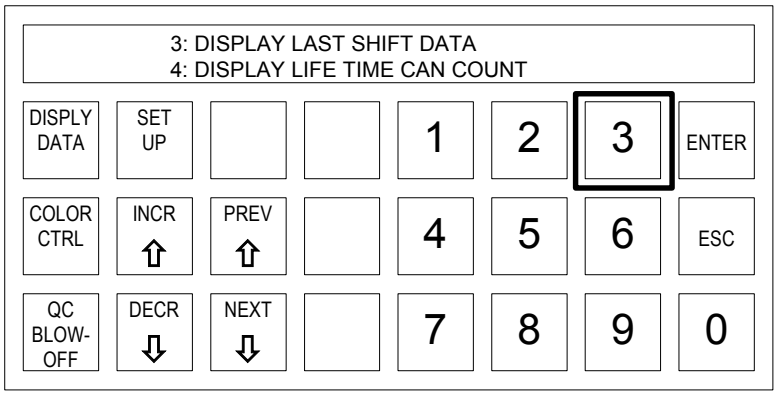
SECTION 1.3
VIEWING LAST SHIFT DATA

The Last Shift data menu displays the following data accumulated for the previous shift:

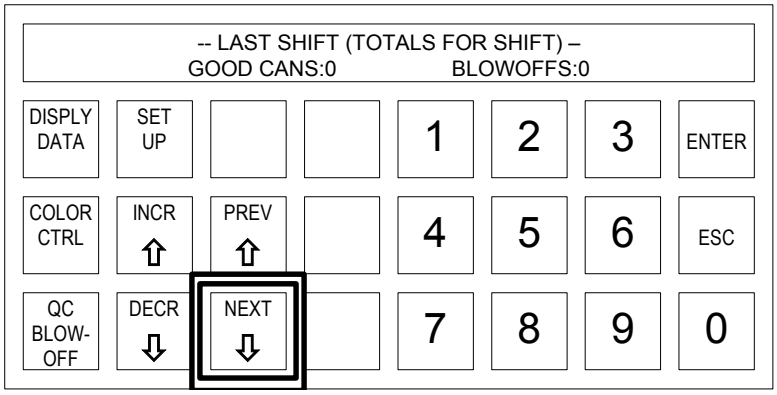
- o Total Number of "Good Cans"
- o Total Number of "Blow offs"
- o Total Number of "Mis-Loads" Bad Can Blow-offs
- o Total Number of "Restart Blow-offs"
- o Total Number of "Manual Blow-offs"
- o Total Number of "QC Blow-offs"
- o Total "Trips (Mis-loads) per Spindle"

To display the "Last Shift" data, perform the following:

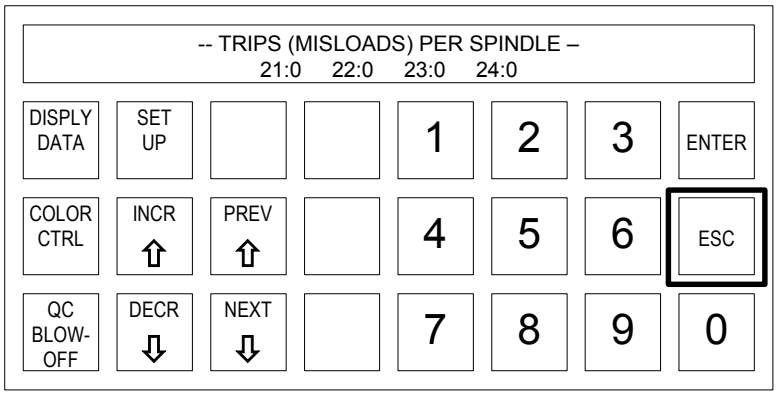
1) With the main "Data Display" menu displayed, press the "3" key.



2) The number of "Good Cans" and the number of "Blow-offs" are displayed on the first screen. Press the "NEXT" key to display the current number of "Bad Blow-offs" and "Restart Blow-offs". Continue to press the "NEXT" key to view the remainder of the data. Press the "PREV" key to retard back to the previous data display.



3) Once all data displays have been observed, press the "ESC" key to return to the main "Data Display" menu.

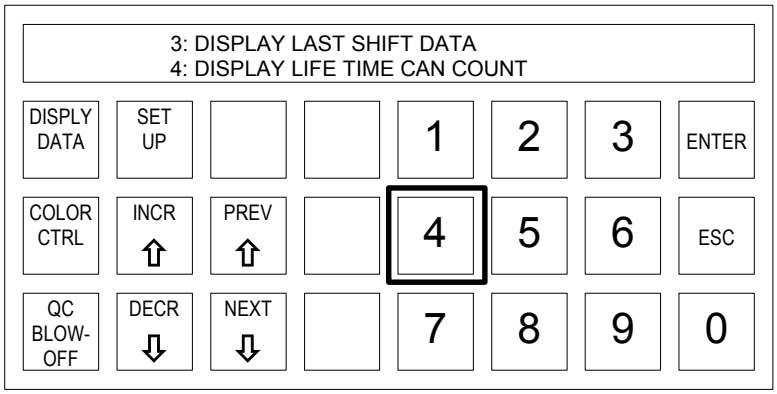


SECTION 1.4
VIEWING LIFE TIME CAN COUNT

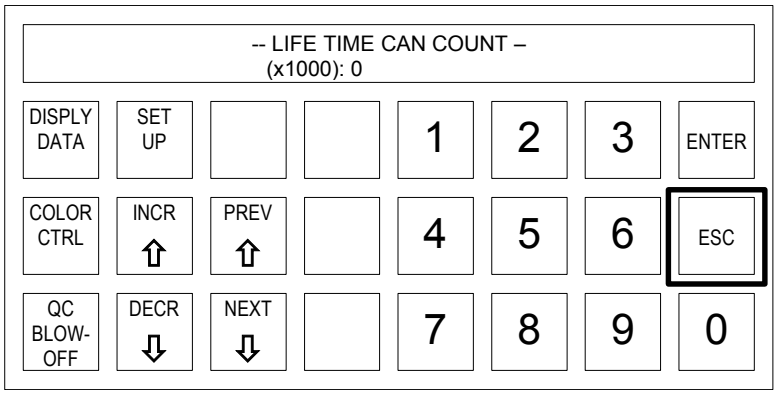
The “Life Time Can Count” data menu displays the total number of “Good Cans” produced since the machine was installed or module replacement. This data register is never reset.

To display the “Life Time Can Count”, perform the following:

1) With the main “Display Data” menu displayed, press the “4” key.



2) The “Life Time Can Count” (x1000) is displayed. Press the “ESC” key to return to the main “Data Display” menu.

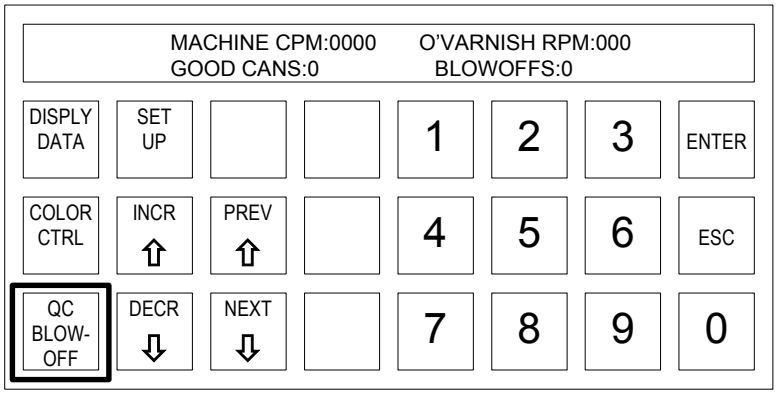


SECTION 2
Q.C. SELECT-A-CAN BLOW-OFF

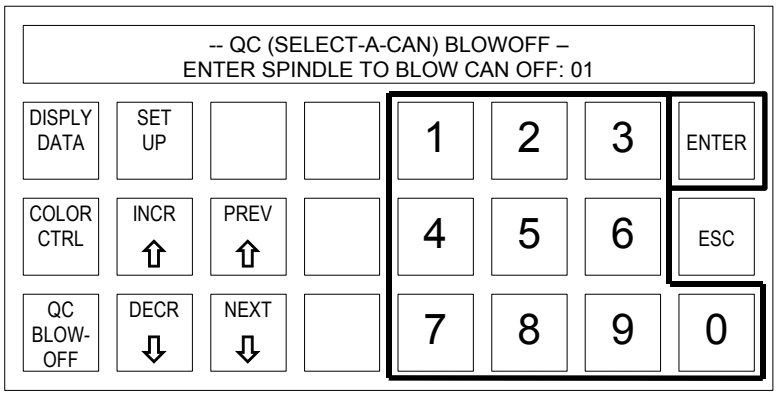
The QC blow-off key is used to "Blow-Off" a can from a selected spindle at the pin chain QC blow-off port.

To blow-off a can, perform the following:

1) With the main menu displayed, press the "QC BLOW-OFF" key.



2) The display will then prompt to enter a can to blow off. Use the numeric keypad to enter the desired spindle to blow the can off of and press "ENTER".



SECTION 3
SET-UP PARAMETERS

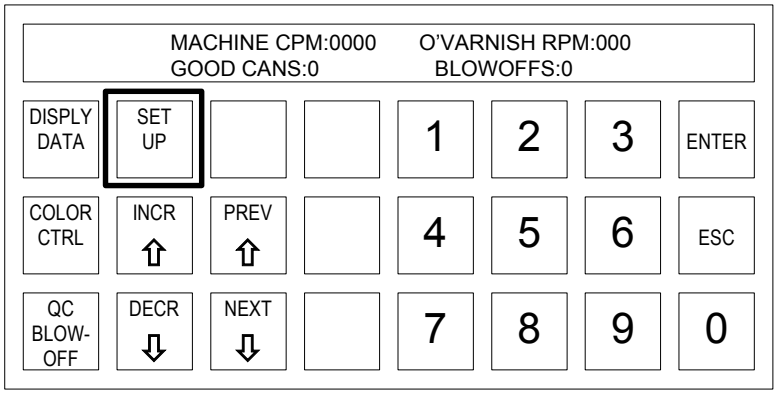
The “Set-up” key, when selected, brings up a listing of sub-menu selections to adjust the following parameters:

1: Speed Parameters
2: Ductor Parameters
3: Pin Chain / QC Blowoff Parameters
4: Machine Timing
5: Set Resolver Offset (zero machine)

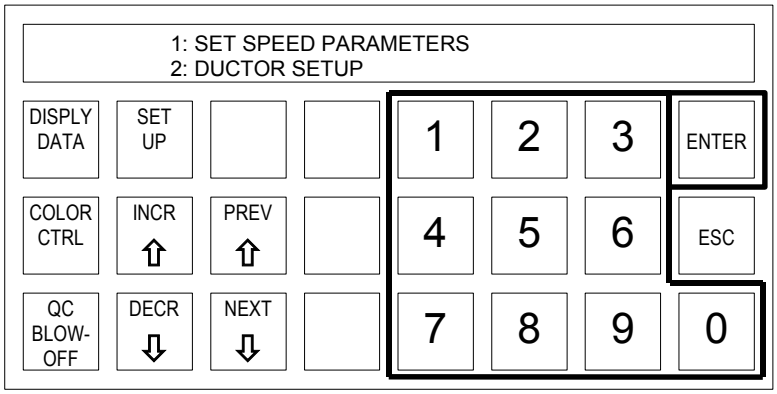
Note: The “Setup” key is enabled when the “M4500 Setup” selector switch is in the “Enable” position.

To display the “Set-up” menu selections perform the following:

1) With the “Main Menu”, press the “SET-UP” key.



2) Using the numeric keypad, enter 1-5 to enter the set-up selections.



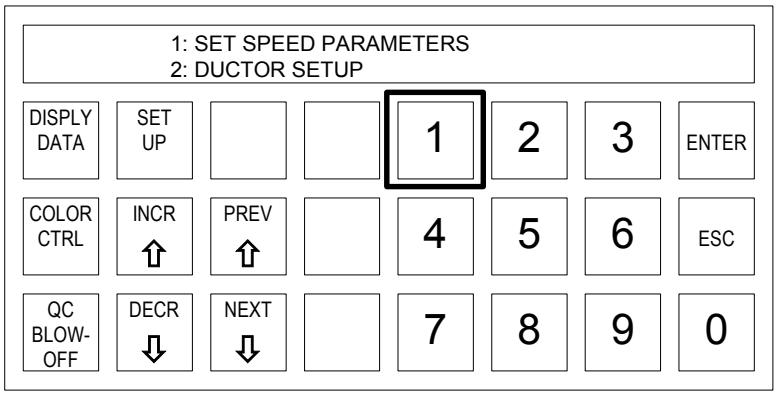
SECTION 3.1
SET-UP SPEED PARAMETERS

The “Set Speed Parameters” allows the user to set-up the following selections:

- o Canfeed Enable Speed Parameters
- o O’Varnish Roll Speed Calibrate

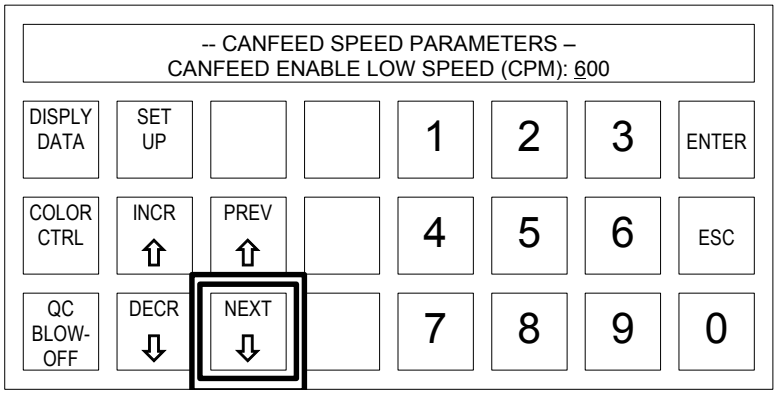
To “Set Speed Parameters”, perform the following:

1) With the main “Set-up” menu selections displayed, press the “1” key.

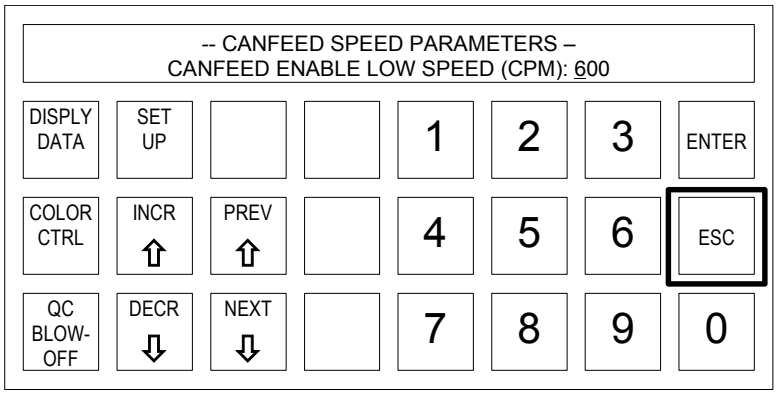


2) The first set-up selection “Speed Parameters” is displayed.

   Press the “NEXT” key to advance to the next set-up selection or the “PREV” key to retard to the previous. Press the “ESC” key to return to the main “Set-up” selection display.



3) Press the “ESC” key to return to the primary set-up menu. Press the “ESC” key again to return to the main display.

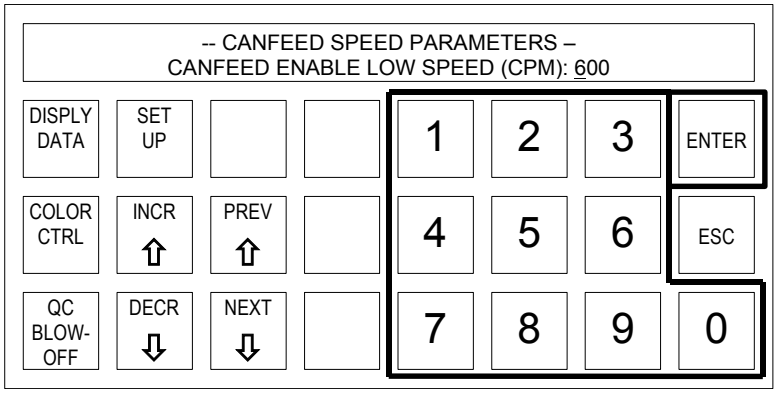


SECTION 3.1.1
SET CANFEED ENABLE SPEED PARAMETERS

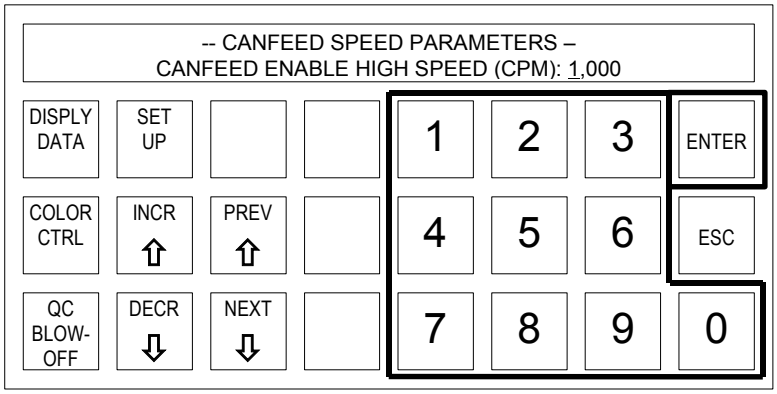
The "Canfeed Enable Low Speed" and "Canfeed Enable High Speed" are used in conjunction with one another to define a window within which the can gate can be opened or closed. This allows the flow of cans to be controlled whenever the machine speed is inside this window. This window should be set for optimal loading conditions.

To set the "Canfeed Enable Speed" parameters, perform the following:

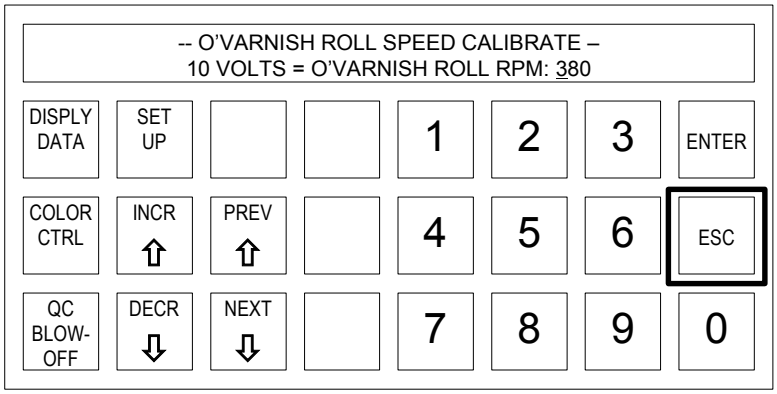
1) After entering the "Set Speed Parameters" selection, the "Canfeed Enable Low Speed" set-up selection is displayed. On the numeric keypad, enter the canfeed enable low speed in "Cans Per Minute" (CPM) and press "ENTER".



2) The "Canfeed Enable High Speed" selection is then displayed. On the numeric keypad, enter the canfeed enable high speed in "Cans Per Minute" (CPM) and press "ENTER".



3) The canfeed speed parameters are now set. Press the "ESC" key to return to the primary set-up menu.

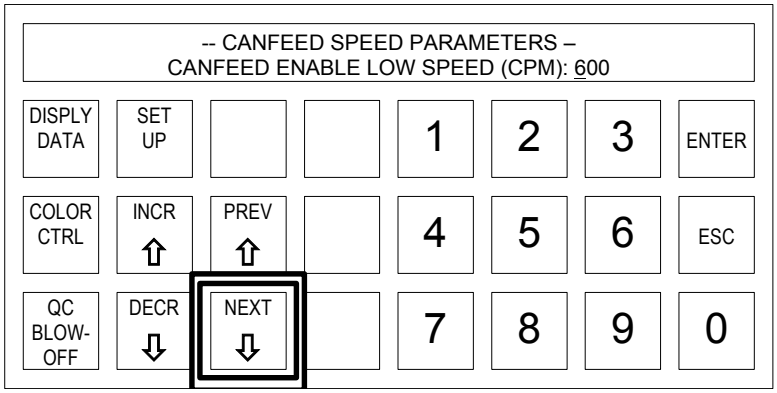


SECTION 3.1.2
SET O'VARNISH ROLL SPEED CALIBRATE

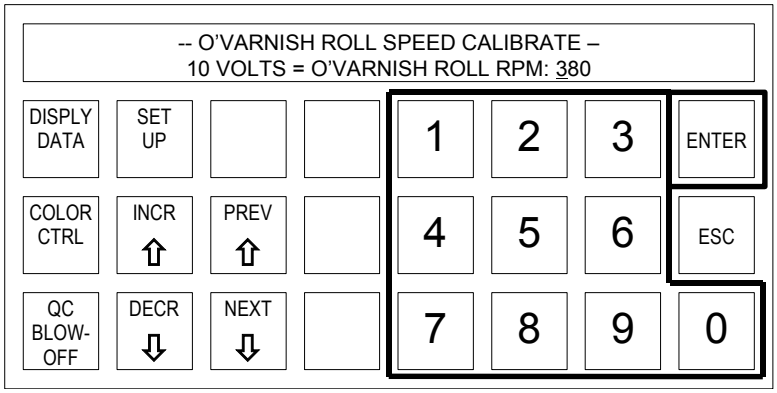
The O'Varnish drive speed input is a 0-10VDC signal from the O'Varnish drive (if available). The roll speed calibrate is used to scale this signal to display the "O'Varnish RPM". The number entered here should equal the O'Varnish roll speed when the drive is at full speed (input = 10VDC).

To set the "O'Varnish Roll Speed Calibrate", perform the following:

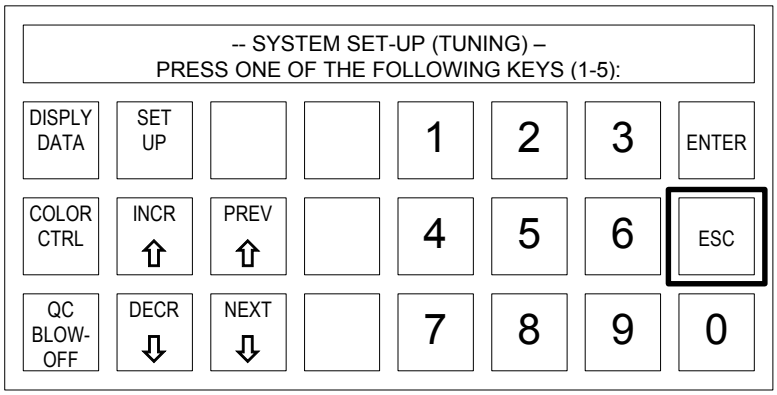
1) After entering the "Set Speed Parameters" selection, the "Canfeed Enable Low Speed" set-up selection is displayed. Press the "NEXT" key until the "O'Varnish Roll Speed Calibrate" prompt is displayed.



2) On the numeric keypad, enter the O'Varnish roll speed in RPM (when drive output signal is 10VDC) and press "ENTER"



3) The calibration of the O'Varnish roll speed RPM is now set. Press the "ESC" key to return to the main display.



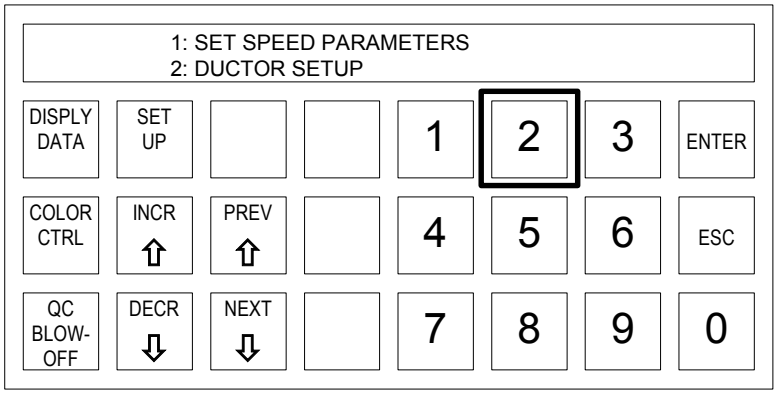
SECTION 3.2
SETUP DUCTOR PARAMETERS

The “Ductor Setup” allows the user to set-up the following selections:

- o Ductor Cycle Duration
- o Ductor Maximum ON Duration
- o Ductor Feedback Enable

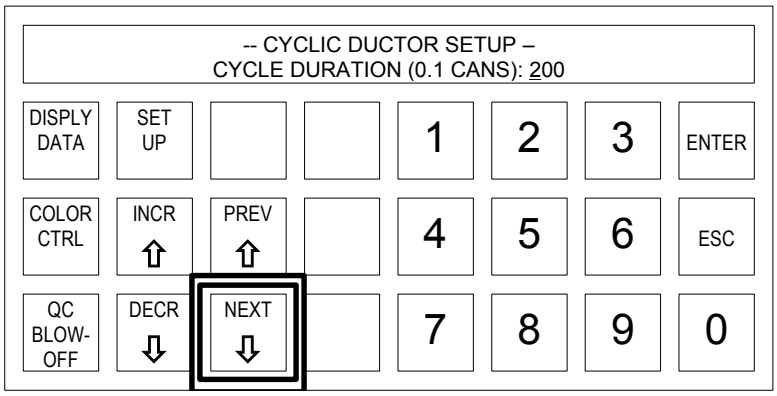
To set-up the “Ductor Parameters”, perform the following:

1) With the main “Set-up” menu selections displayed, press the “2” key.

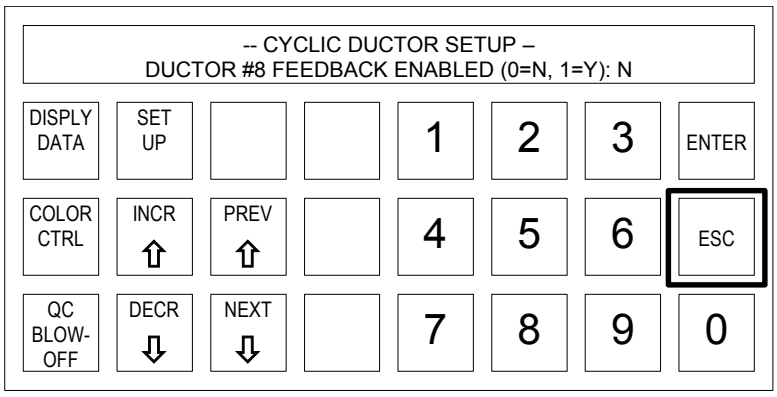


2) The first set-up selection is displayed.

   Press the “NEXT” key to advance to the next set-up selection or the “PREV” key to retard to the previous. Press the “ESC” key to return to the main “Set-up” selection display.



3) Press the “ESC” key to return to the primary set-up menu. Press the “ESC” key again to return to the main display.

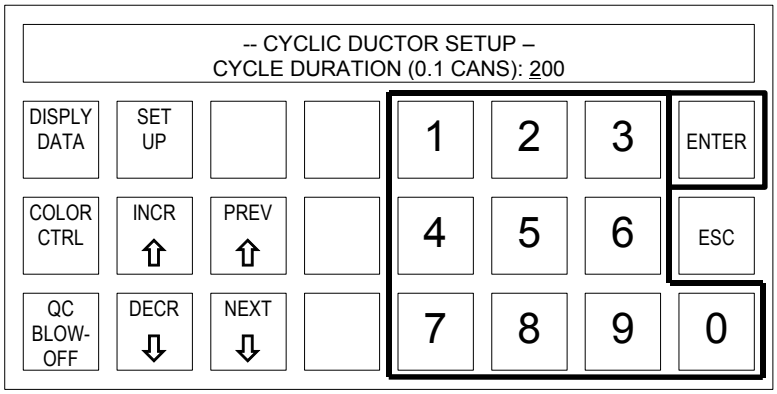


SECTION 3.2.1
SET DUCTOR CYCLE DURATION

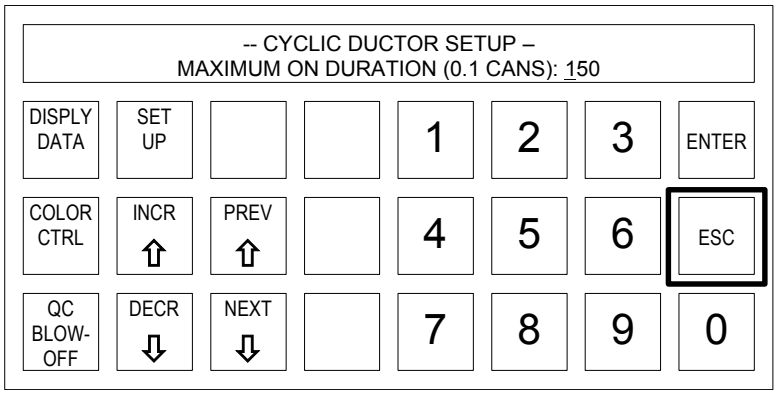
The Ductor Cycle Duration is the rate at which ink is transferred from the fountain roll for all ductors. This parameter is set to 1/10th of a can resolution, with a maximum setting of 25 cans or 250 10th's of a can.

To set the "Ductor Cycle Duration", perform the following:

1) After entering the "Ductor Setup" selection, the "Cycle Duration" set-up selection is displayed. On the numeric keypad, enter the desired cycle duration in a 10th of a can resolution and press "ENTER".



2) The cycle duration is now set. Press the "ESC" key to return to the primary set-up menu.



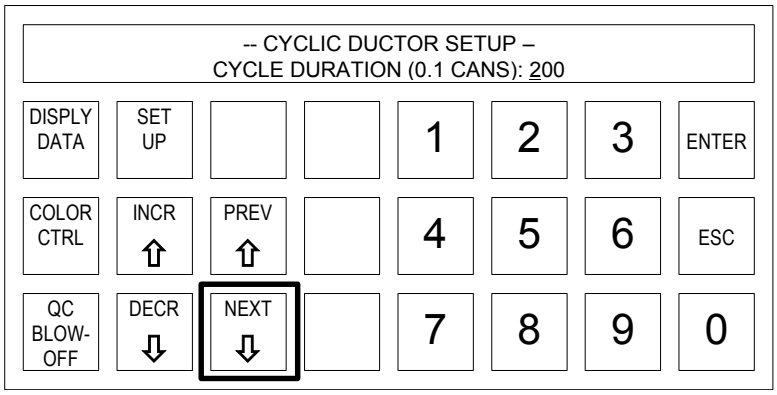
SECTION 3.2.2
SET DUCTOR MAXIMUM ON DURATION

The Maximum ON Duration is the maximum time the ductor roll is allowed to be in contact with the fountain roll. This parameter is used in conjunction with "Color Control" to establish the maximum ink transfer (99% color) for the ductor. This value is also set to 1/10th of a can resolution with a maximum not to exceed 25 cans or 250 10th's of a can.

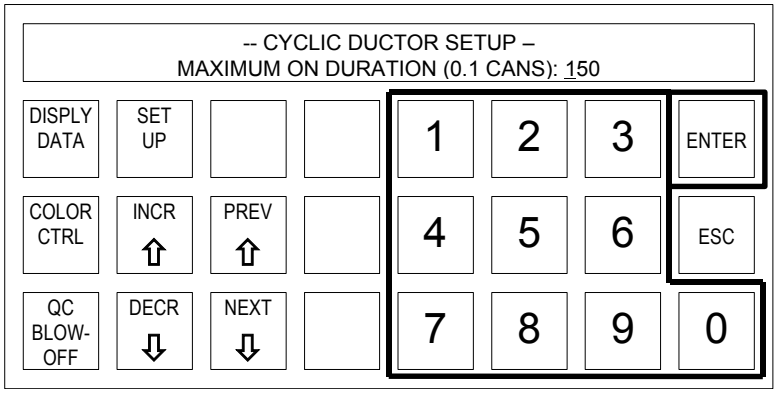
Note: Care should be taken NOT to set the maximum on duration to within 3 cans (30 10th's), of the ductor cycle duration.

To set the "Maximum ON Duration", perform the following:

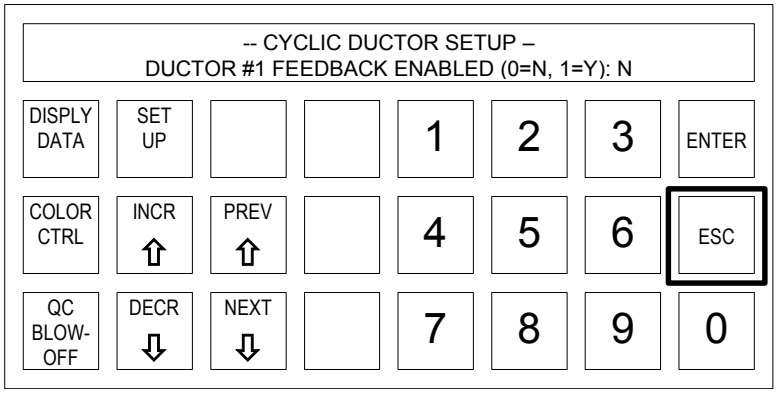
1) After entering the "Ductor Setup" selection, the "Cycle Duration" set-up selection is displayed. Press the "NEXT" key to advance to the "Maximum ON Duration" set-up..



2) On the numeric keypad, enter the desired maximum ON duration in a 10th of a can resolution and press "ENTER".



3) The cycle duration is now set. Press the "ESC" key to return to the primary set-up menu.

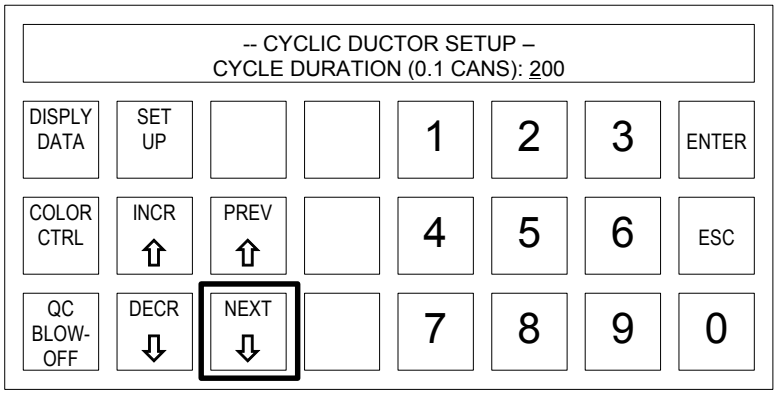


SECTION 3.2.3
SET DUCTOR FEEDBACK ENABLE

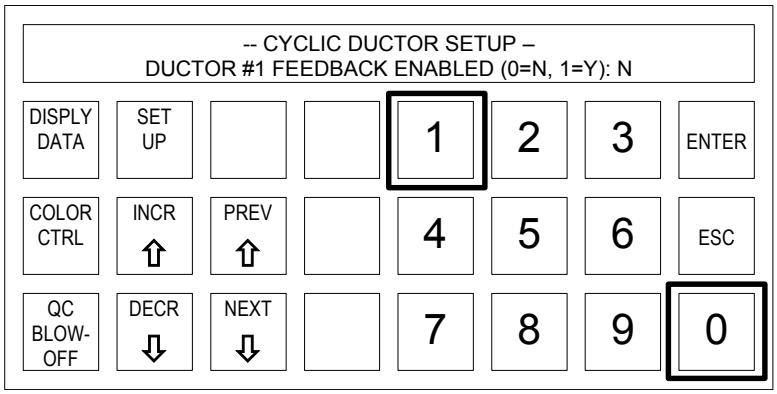
The Ductor Feedback Enable should be used whenever the optional feedback sensors are installed. The feedback enable allows the system to check and verify that the ductor is cycling properly.

To set the "Ductor Feedback Enable", perform the following:

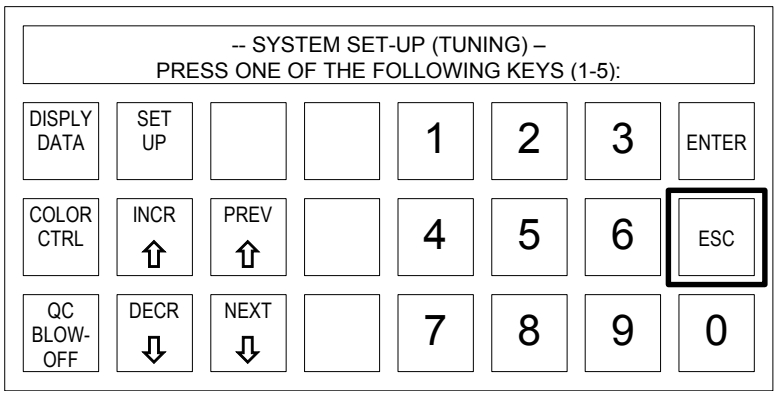
1) After entering the "Ductor Setup" selection, the "Cycle Duration" set-up selection is displayed. Press the "NEXT" key to advance to the "Ductor #1 Feedback Enabled" set-up.



2) On the numeric keypad, enter a "0" to disable feedback, or a "1" to enable feedback. Continue this for all 8 stations or press "ESC" at any time to return to the main set-up menu.



3) The ductor feedback enable is now set. Press the "ESC" key to return to the main display.



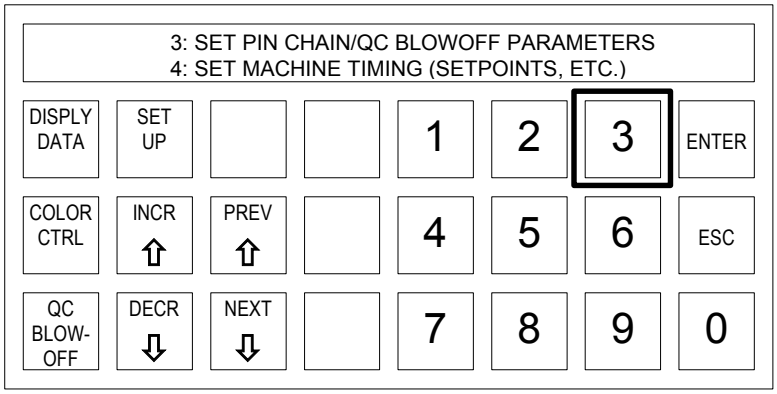
SECTION 3.3
SETUP PIN CHAIN / QC BLOW-OFF PARAMETERS

The "Pin Chain / QC Blow-off Parameters" allows the user to set-up the following selections:

- o Set Number of Cans to Blow-off at Infeed Open
- o Set Number of Cans to Blow-off at Restart (print or varnish)
- o Set Number of Cans to Blow-off for each Misload
- o Set Number of Pins to Pin Chain Blow-off Port
- o Set Q.C. Shift Offset
- o Set Spindle Trip Shift Offset

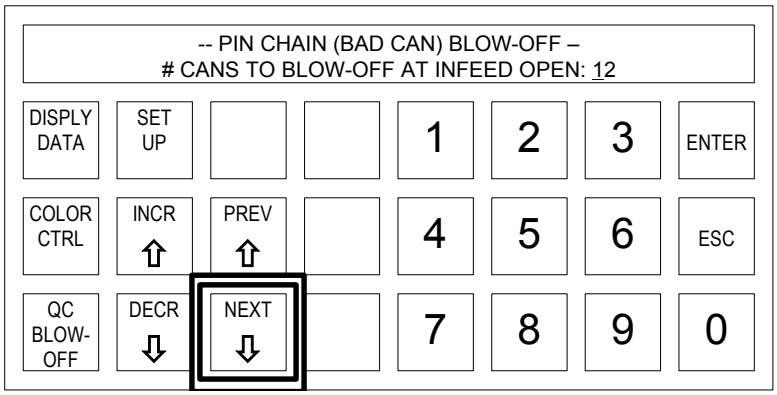
To set-up the "Pin Chain / QC Blow-off Parameters", perform the following:

1) With the main "Set-up" menu selections displayed, press the "3" key.

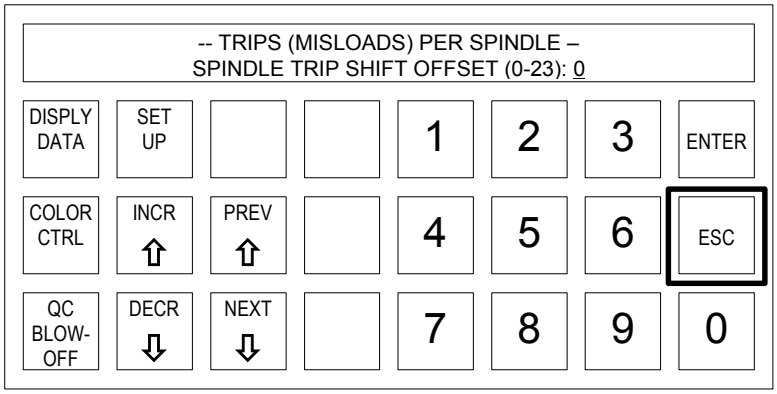


2) The first set-up selection is displayed.

   Press the "NEXT" key to advance to the next set-up selection or the "PREV" key to retard to the previous. Press the "ESC" key to return to the main "Set-up" selection display.



3) Press the "ESC" key to return to the primary set-up menu. Press the "ESC" key again to return to the main display.

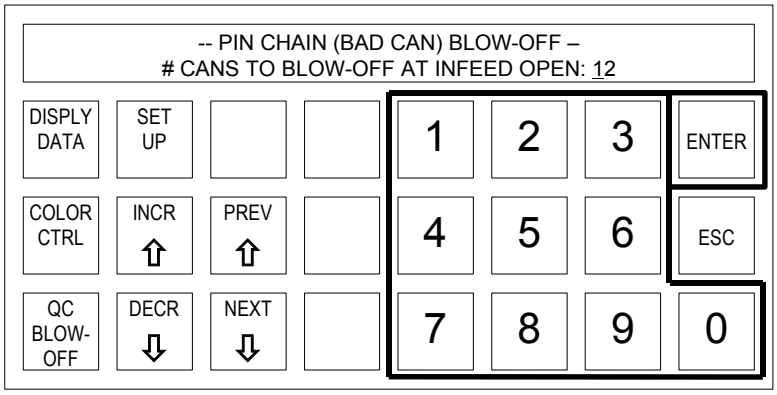


SECTION 3.3.1
SET # OF CANS TO BLOWOFF AT INFEED OPEN

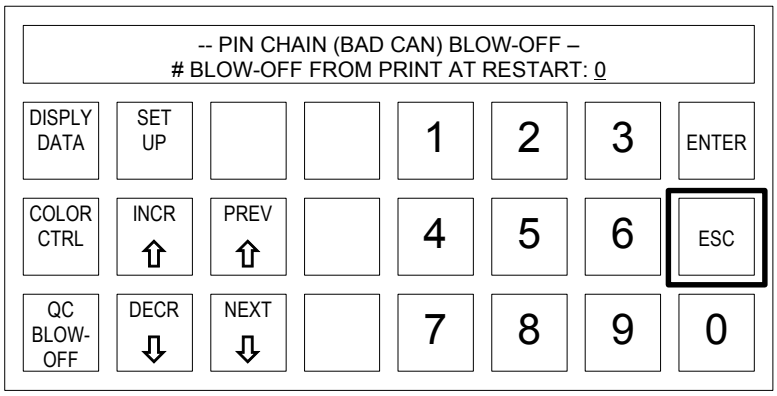
When the infeed is first opened, a specified number of "Cans" can be set to be blown off. Valid range is 0 to 99 cans.

To set the number of cans to blow-off when the infeed is first opened, perform the following:

1) After entering the "Pin Chain / QC Blow-off parameter" selection, the "# of Cans to Blow-off at Infeed Open" set-up selection is displayed. On the numeric keypad, enter the desired number of cans to be blown off and press "ENTER".



2) The number of cans to blow-off at infeed open is now set. Press the "ESC" key to return to the primary set-up menu.

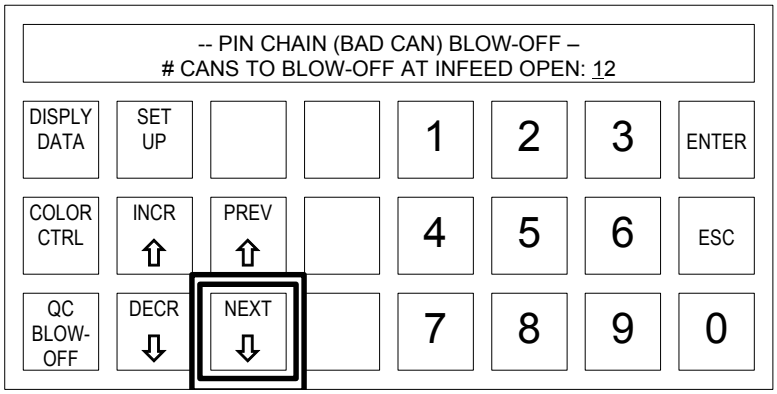


SECTION 3.3.2
SET # OF CANS TO BLOWOFF AT RESTART (print & varnish)

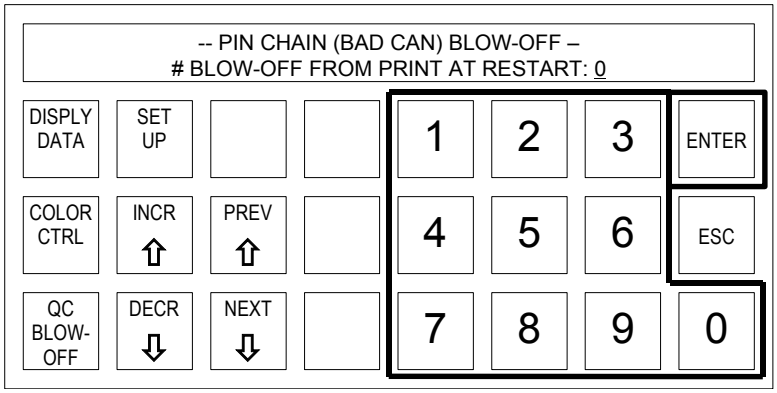
When the machine is restarted, a specified number of "Cans" can be set to be blown off from the print and varnish. Valid range is 0 to 99 cans.

To set the number of cans to blow-off from print and varnish at restart, perform the following:

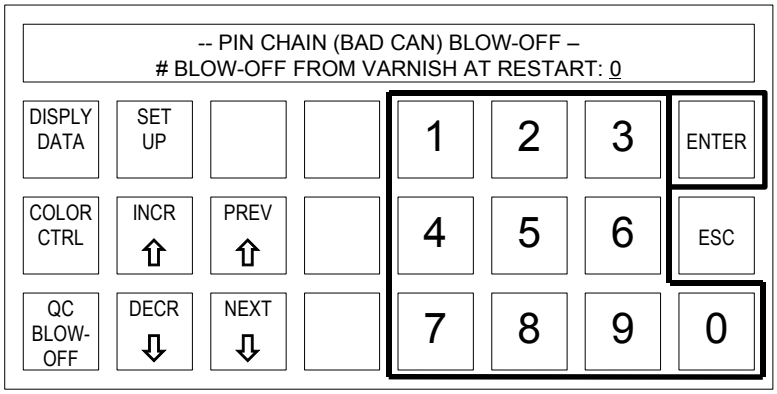
1) After entering the "Pin Chain / QC Blow-off parameter" selection, the "# of Cans to Blow-off at Infeed Open" set-up selection is displayed. Press the "NEXT" key to advance to the "# Blow-off from Print at Restart" set-up.



2) On the numeric keypad, enter the desired number of cans to be blown off from print at restart and press "ENTER".



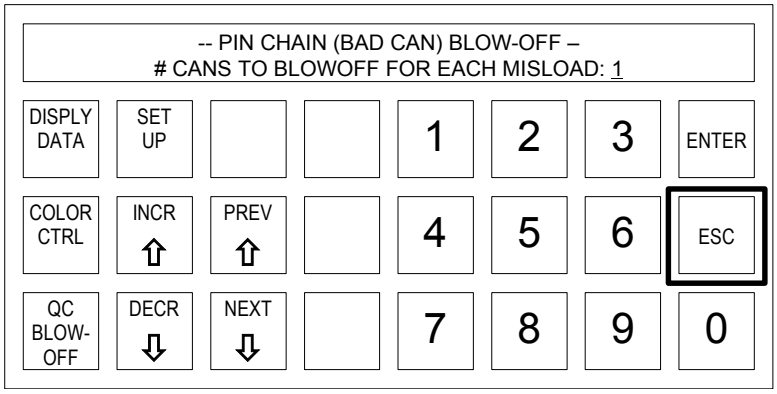
3) On the numeric keypad, enter the desired number of cans to be blown off from varnish at restart and press "ENTER".



(Continued on Next Page)

SECTION 3.3.2
SET # OF CANS TO BLOWOFF AT RESTART (print & varnish)

4) The number of cans to blow-off from print and varnish at restart are now set. Press the “ESC” key to return to the primary set-up menu.

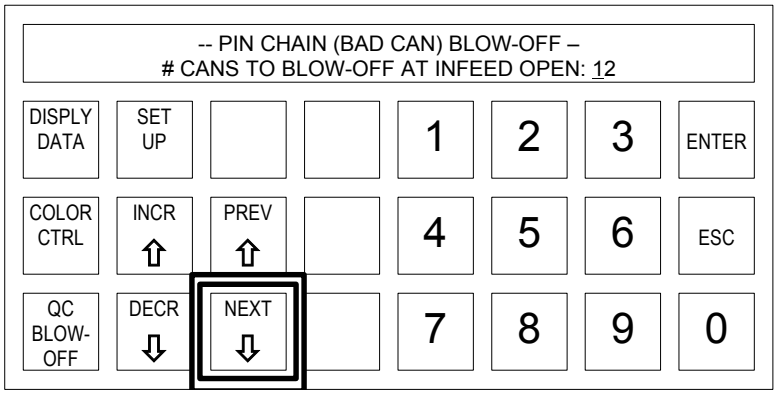


SECTION 3.3.3
SET # OF CANS TO BLOW-OFF FOR EACH MISLOAD

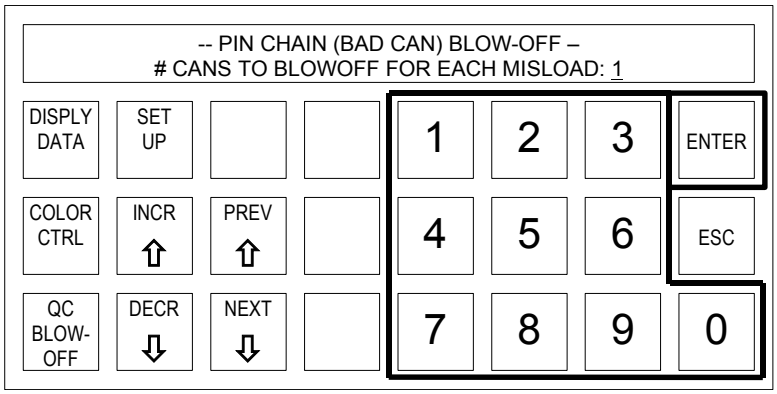
The number of cans to blow-off for each misload is the number of cans blown off at the bad can pin chain blow-off port when a misloaded can is detected (typically set at 1 can).

To set the number of cans to blow-off for each misload, perform the following:

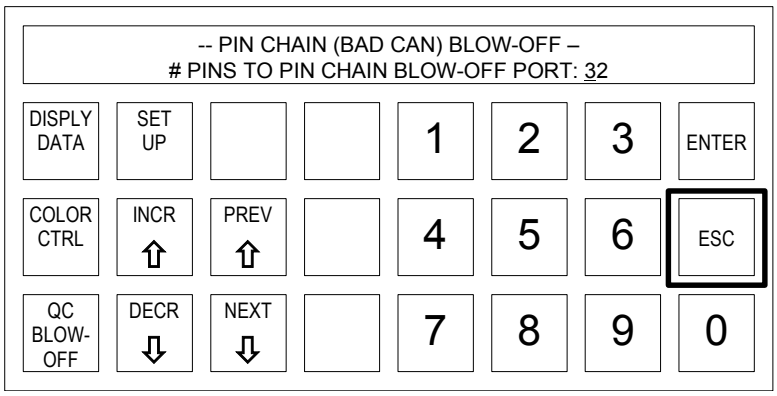
1) After entering the "Pin Chain / QC Blow-off parameter" selection, the "# of Cans to Blow-off at Infeed Open" set-up selection is displayed. Press the "NEXT" key to advance to the "# Cans to Blowoff for each Misload" set-up.



2) On the numeric keypad, enter the desired number of cans to be blown off for each misload (typically set to 1) and press "ENTER".



3) The number of cans to blow-off for each misload is now set. Press the "ESC" key to return to the primary set-up menu.

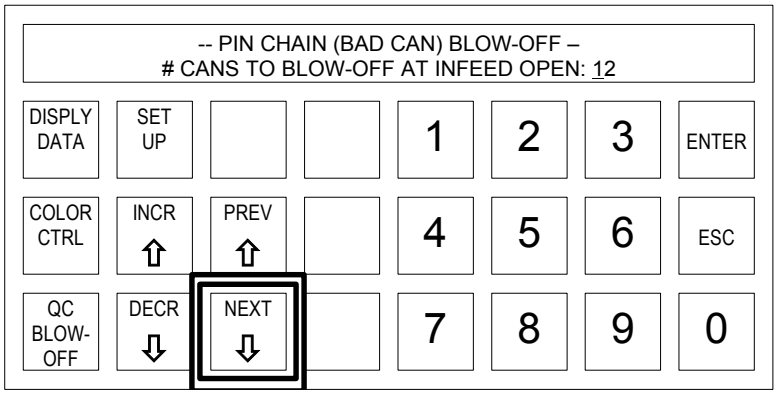


SECTION 3.3.4
SET # OF PINS TO PIN CHAIN BLOWOFF PORT

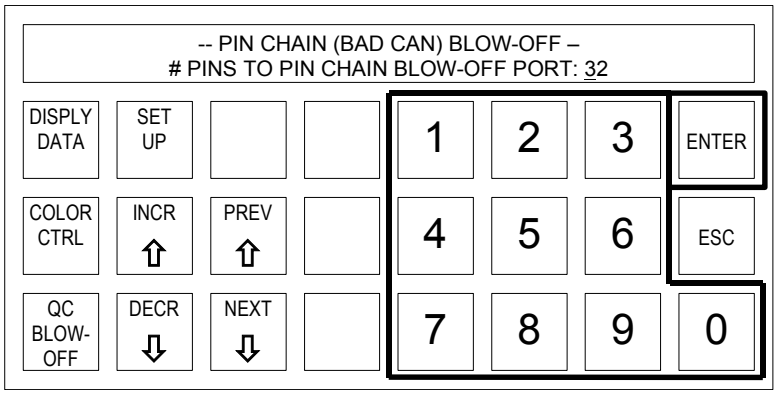
The number of pins to Pin Chain blow-off port is the number of pins form the spindle wheel to disk transfer location to the first can blown off at the Pin Chain blow-off port minus two.

To set the number of pins to the Pin Chain blow-off port, perform the following:

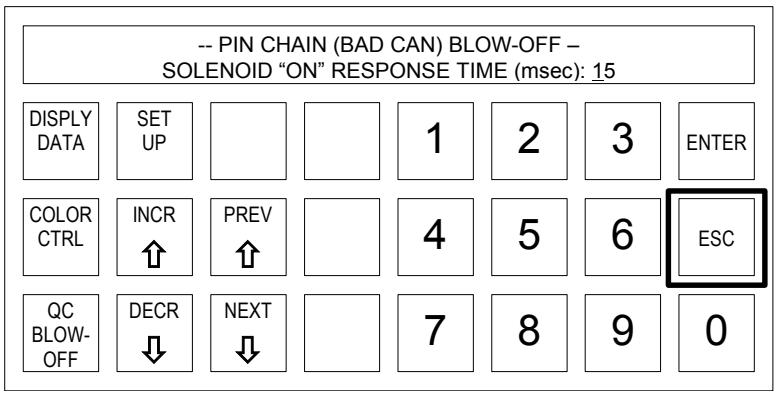
1) After entering the "Pin Chain / QC Blow-off parameter" selection, the "# of Cans to Blow-off at Infeed Open" set-up selection is displayed. Press the "NEXT" key to advance to the # Pins to Pin Chain Blow-off Port" set-up.



2) On the numeric keypad, enter the number of pins to pin chain blow-off port and press "ENTER".



3) The number of pins to pin chain blow-off port is now set. Press the "ESC" key to return to the primary set-up menu.

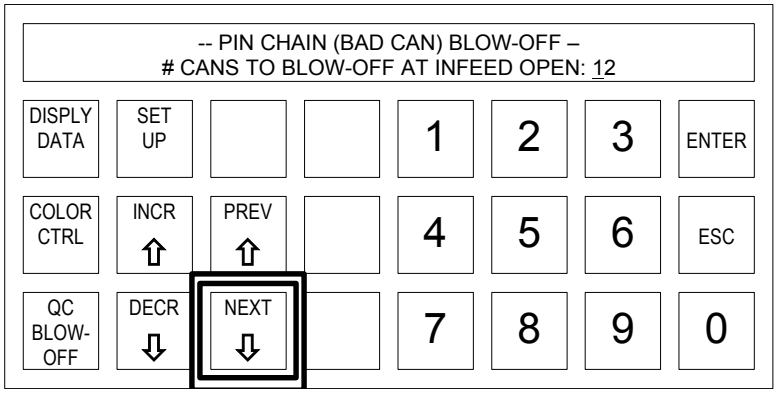


SECTION 3.3.5
SET Q.C. SHIFT OFFSET

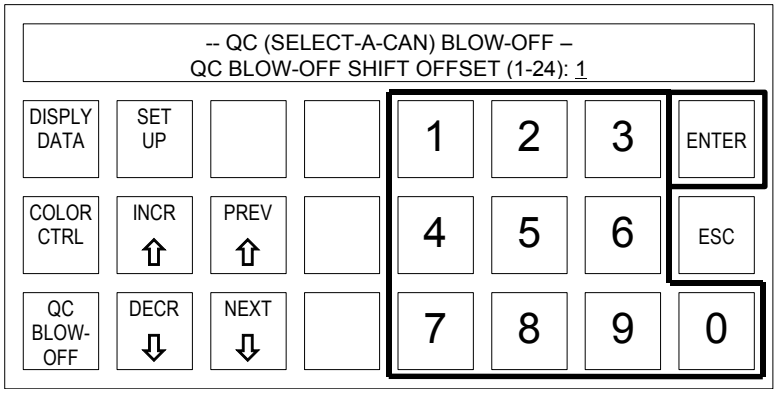
The QC blow-off shift offset is the number of spindles difference from detection of the spindle #1 flag to the QC blow-off port. This is a number between 1 and 24 and is empirically set by selecting spindle #1 for blow-off and adjusting this value until the can from spindle #1 is the can that is blown off.

To set the QC Blow-off shift offset, perform the following:

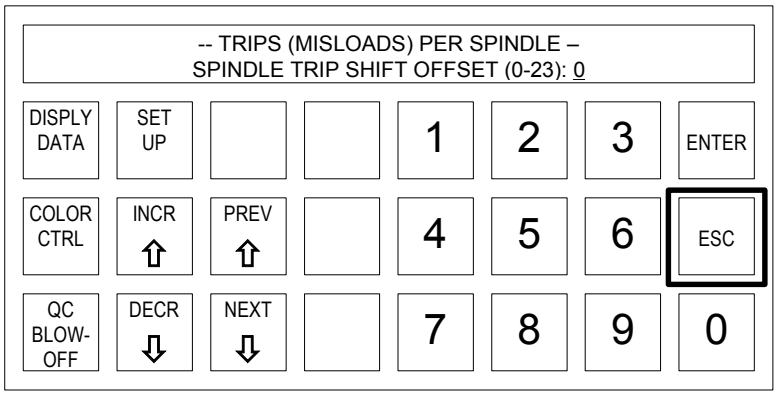
1) After entering the "Pin Chain / QC Blow-off parameter" selection, the "# of Cans to Blow-off at Infeed Open" set-up selection is displayed. Press the "NEXT" key to advance to the "QC Blow-off Shift Offset" set-up.



2) On the numeric keypad, enter the number of spindles difference from detection of the spindle #1 flag to the QC Blow-off port and press "ENTER".



3) The QC Blow-off shift offset is now set. Press the "ESC" key to return to the primary set-up menu.

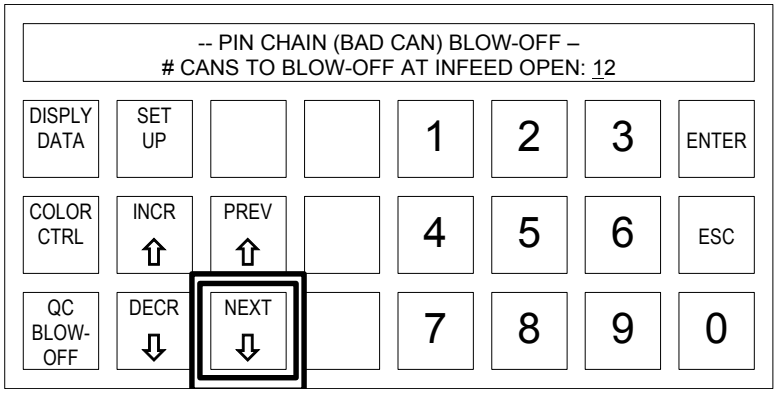


SECTION 3.3.6
SET SPINDLE TRIP SHIFT OFFSET

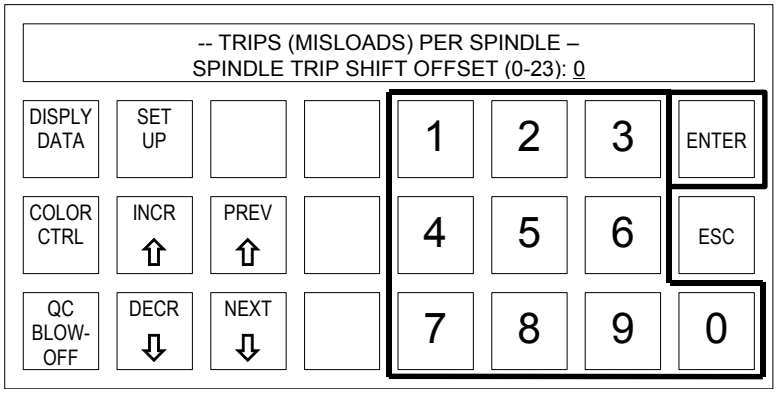
The spindle trip shift offset is the number of spindles difference from detection of the spindle #1 flag to the Can/No Can sensor. This is a number between 0 and 23 and is empirically set such that a mis-loaded can on spindle #1 increments the spindle #1 count in the "Trips per spindle" menu.

To set the spindle trip shift offset, perform the following:

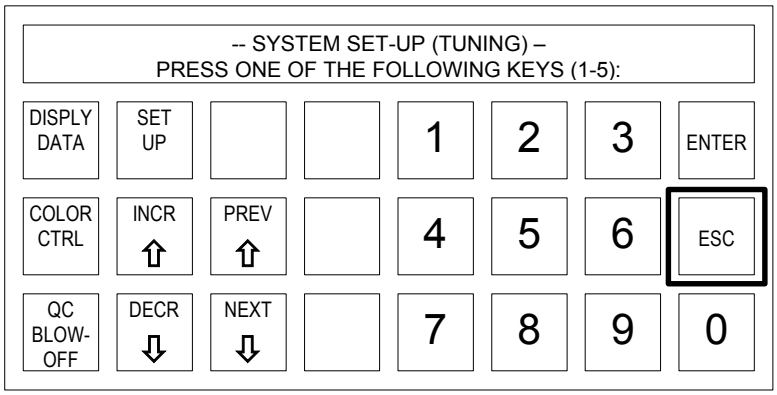
1) After entering the "Pin Chain / QC Blow-off parameter" selection, the "# of Cans to Blow-off at Infeed Open" set-up selection is displayed. Press the "NEXT" key to advance to the "Spindle Trip Shift Offset" set-up.



2) On the numeric keypad, enter the number of spindles difference from detection of the spindle #1 flag and spindle number 1 and press "ENTER".



3) The spindle trip shift offset is now set. Press the "ESC" key to return to the main display.



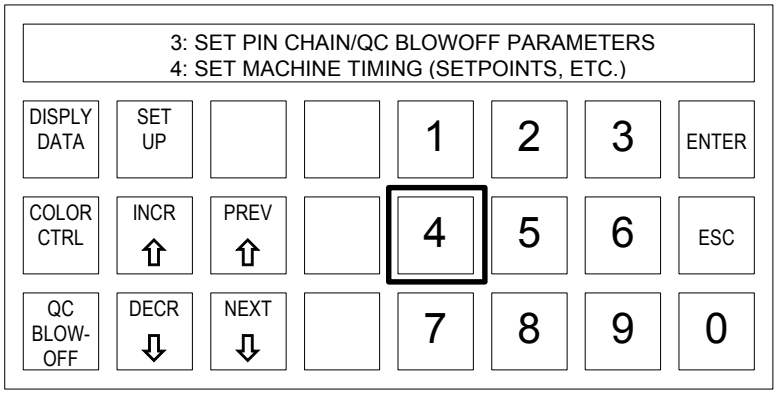
SECTION 3.4
SET MACHINE TIMING

The “Machine Timing” allows the user to set the following timing locations:

- o Set Bad Can Blow-off “ON” Position
- o Set Q.C. Can Blow-off “ON” Position
- o Set Can Gate Timing “ON” Position

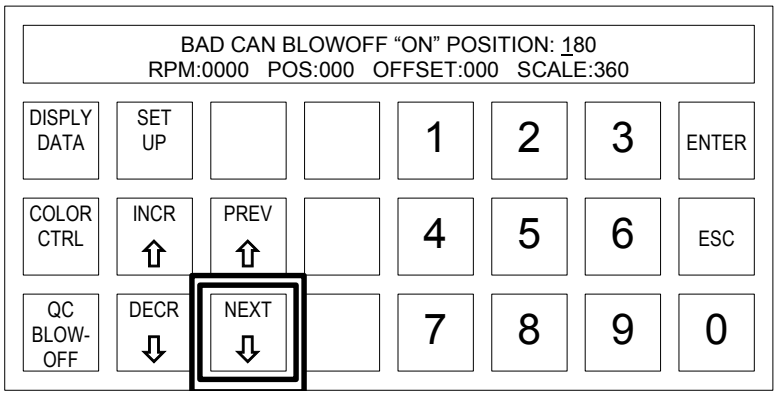
To set-up the Machine Timing set-points, perform the following:

1) With the main “Set-up” menu selections displayed, press the “4” key.

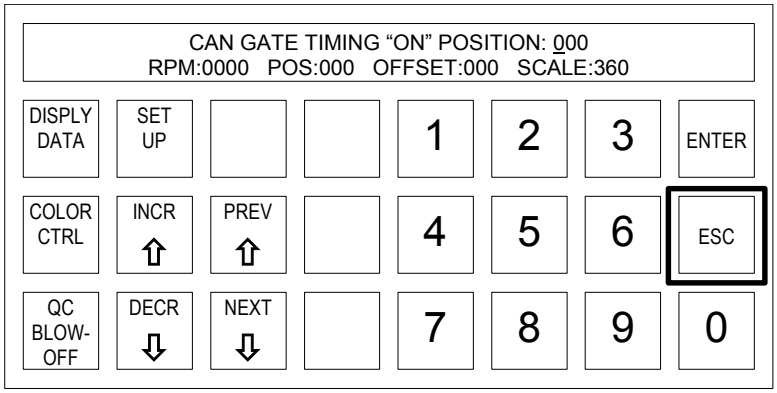


2) The first timing selection is displayed.

   Press the “NEXT” key to advance to the next set-up selection or the “PREV” key to retard to the previous. Press the “ESC” key to return to the main “Set-up” selection display.



3) Press the “ESC” key to return to the primary set-up menu. Press the “ESC” key again to return to the main display.

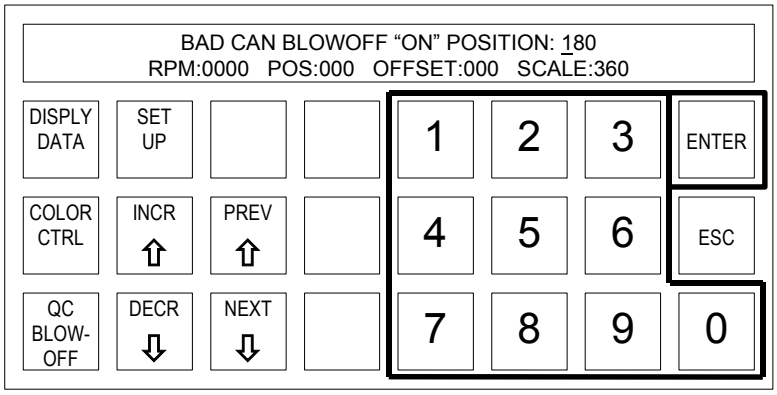


SECTION 3.4.1
BAD CAN BLOW-OFF "ON" POSITION TIMING

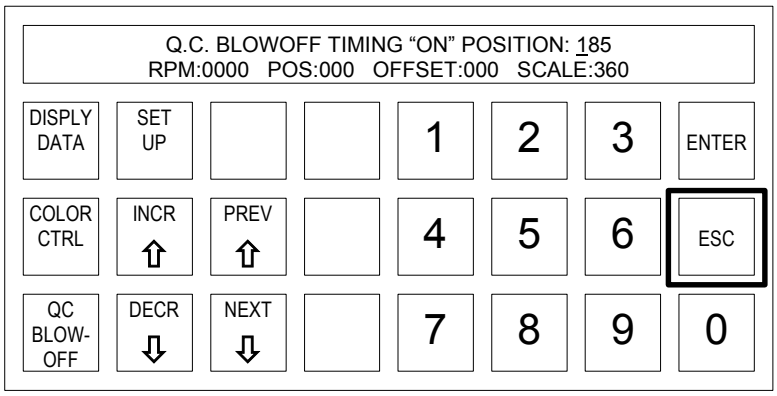
Set this signal to turn "ON" when the pin chain blow-off port is centered between pins on the chain.

To set the "Bad Can" blow-off "ON" position timing, perform the following:

1) After entering the "Set Machine Timing" selection, the "Bad Can Blowoff "ON" Position" timing selection is displayed. On the numeric keypad, enter the position of the machine when the bad can blow-off port is centered between pins on the chain and press "ENTER".



2) The bad can blow-off "ON" position is now set. Press the "ESC" key to return to the primary set-up menu.

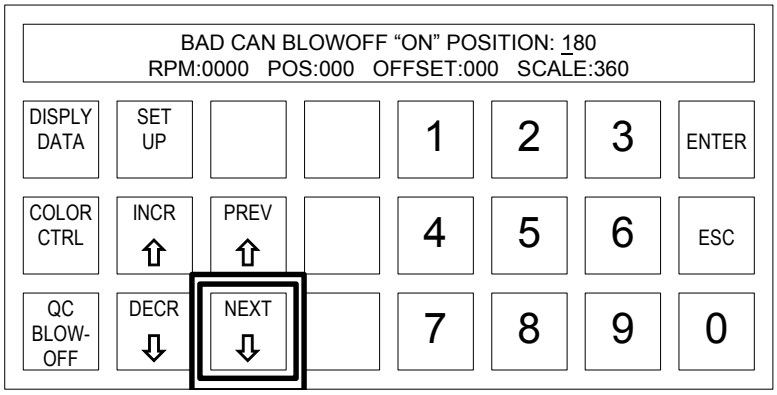


SECTION 3.4.2
Q.C. CAN BLOW-OFF “ON” POSITION TIMING

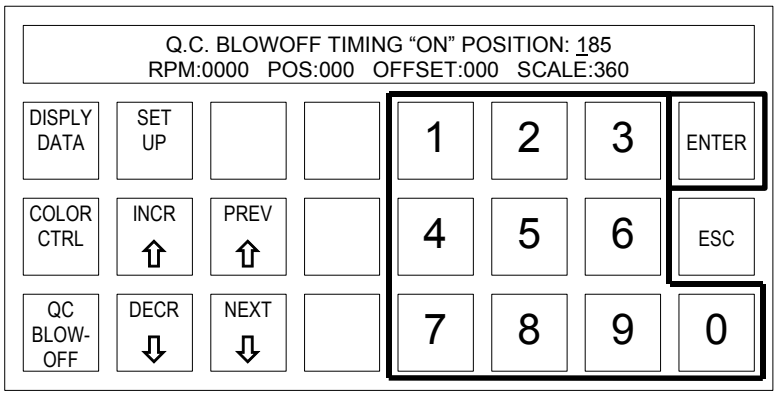
Set this signal to turn “ON” when the select-a-can pin chain blow-off port is centered between pins on the chain.

To set the “QC” blow-off “ON” position timing, perform the following:

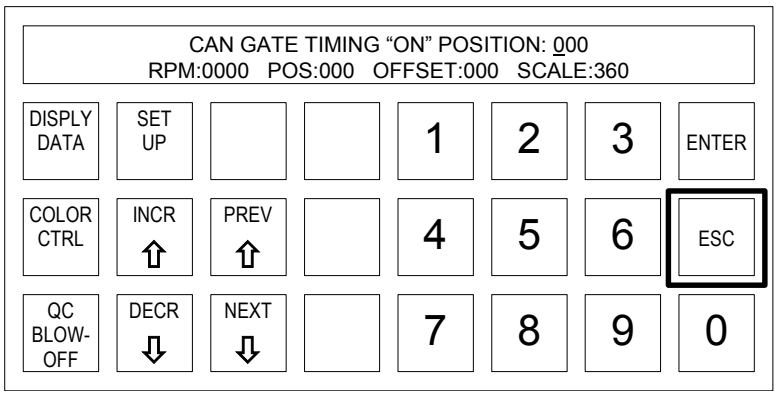
1) After entering the “Set Machine Timing” selection, the “Bad Can Blowoff “ON” Position” timing selection is displayed. Press the “NEXT” key to advance to the “Q.C. Blowoff Timing “ON” Position” timing.



2) On the numeric keypad, enter the position of the machine when the Q.C. select-a-can blow-off port is centered between pins on the chain and press “ENTER”.



3) The Q.C. blow-off timing “ON” position is now set. Press the “ESC” key to return to the primary set-up menu.

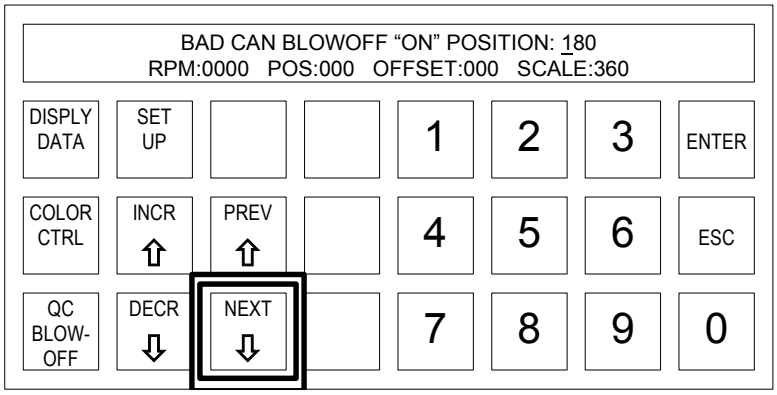


SECTION 3.4.3
CAN GATE TIMING "ON" POSITION

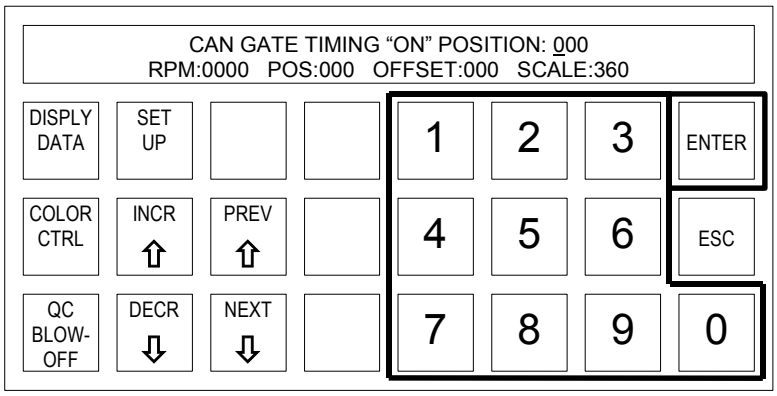
This signal is used to open and close the can gate.. Adjust the "ON" position for proper can gate operation.

To set the "Can Gate" open "ON" position timing, perform the following:

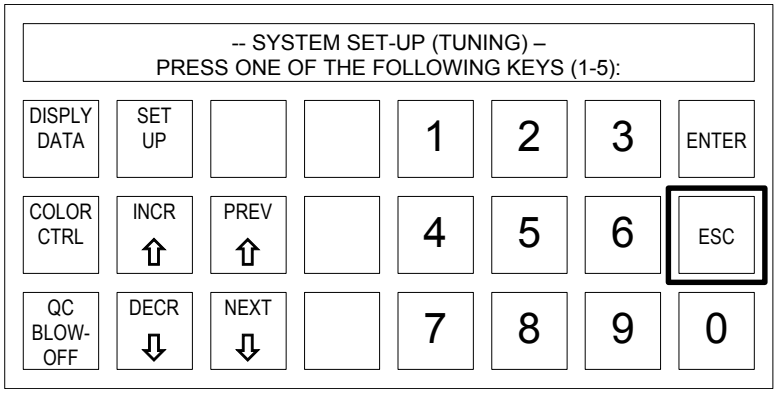
1) After entering the "Set Machine Timing" selection, the "Bad Can Blowoff "ON" Position" timing selection is displayed. Press the "NEXT" key to advance to the "Can Gate Timing "ON" Position" timing.



2) On the numeric keypad, enter the position of the machine when can gate should be opened and press "ENTER".



3) The can gate timing "ON" position is now set. Press the "ESC" key to return to the main display.

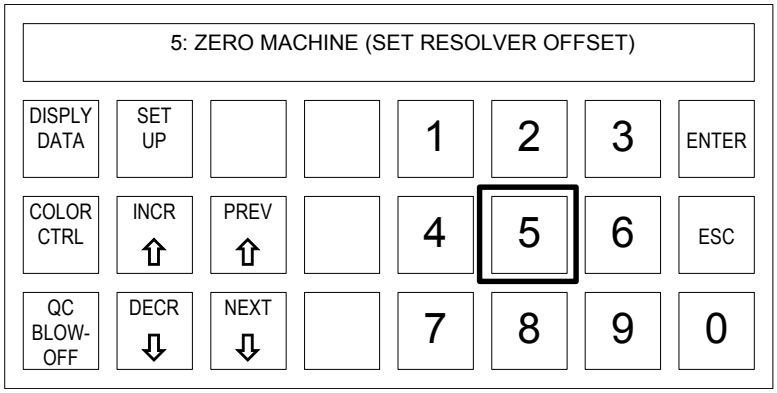


SECTION 3.5
ZERO MACHINE (SET RESOLVER OFFSET)

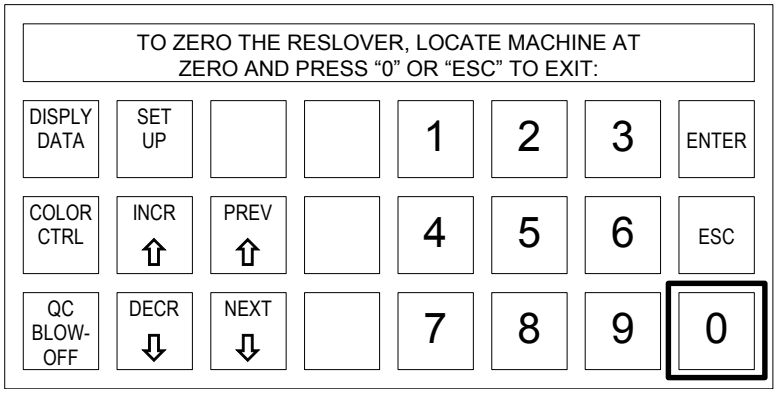
Machine zero is defined at the point where the "B" trip cam follower is just past the "B" trip cam. Since the APMDEC uses a resolver for machine timing instead of an encoder, the zero of the machine can be set electronically instead of having to move the shaft of the resolver as would have to be done on an encoder.

To set the resolver offset (machine zero), perform the following:

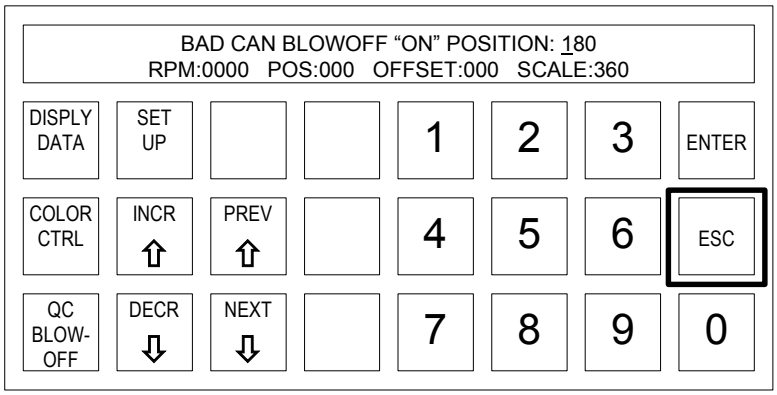
1) With the main "Set-up" menu selections displayed, press the "5" key.



2) Press the "0" key to zero the resolver. The offset required to make the current position "000" will be calculated and displayed in the "Offset" field.



3) The resolver is now zeroed. Press the "ESC" key to return to the primary set-up menu.

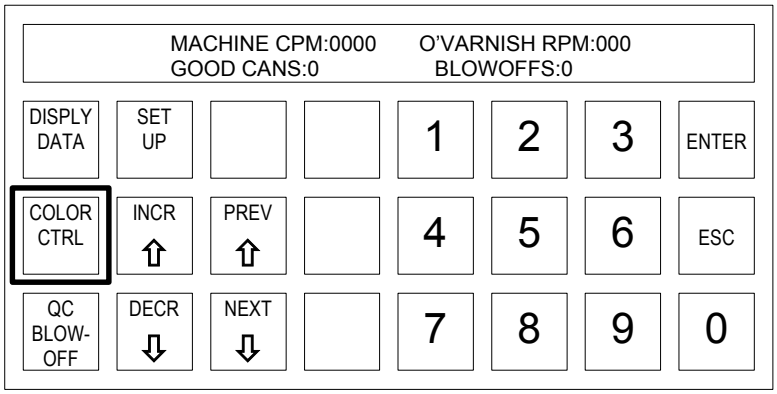


SECTION 4
COLOR CONTROL

The Color Control menu allows the user to adjust the percent color (on duration adjustment) for each ink station for up to 450 different label configurations.

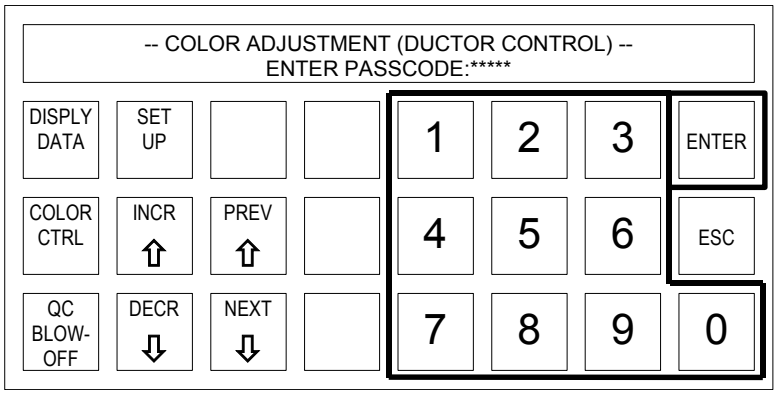
To enter the "Color Control" menu, perform the following:

1) With the "Main Menu" displayed, press the "COLOR CONTROL" key.

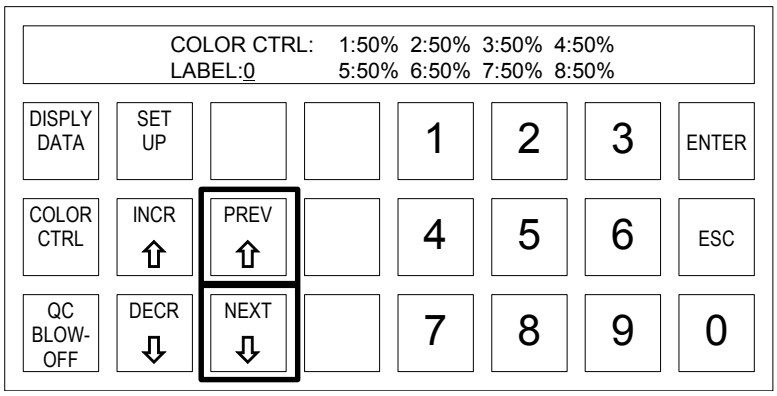


2) Enter the 5 digit passcode on the numeric keypad and press "ENTER"

   Note: The passcode is set by the user as desired. Refer to the User's manual for details on setting the passcode.



3) Use the "NEXT" and PREV" keys to move to the different fields. Press the "ESC" key at any time to return to the "Main Display".

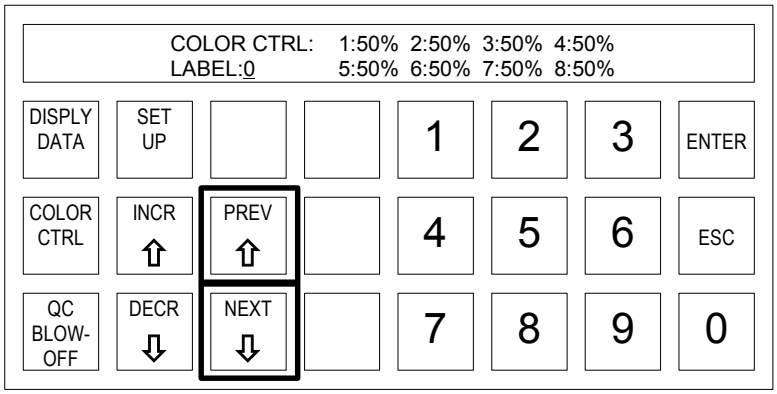


SECTION 4.1
SET / ADJUST CURRENT LABEL NUMBER

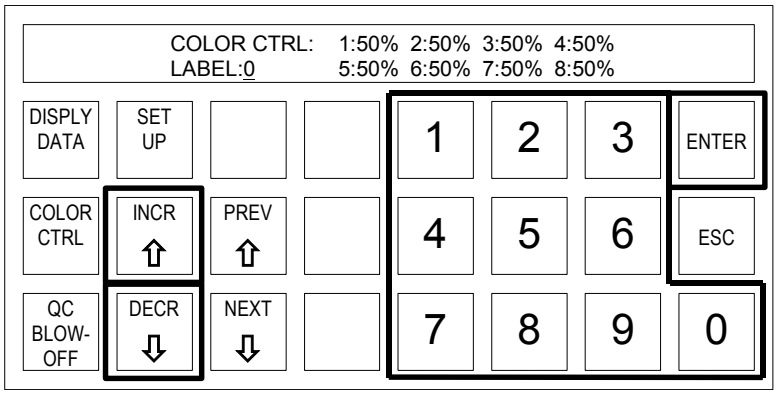
The Color Control menu holds up to 450 label configurations. Use the label number to save percent color configurations for each ink station.

To set / adjust the "Current Label" number, perform the following:

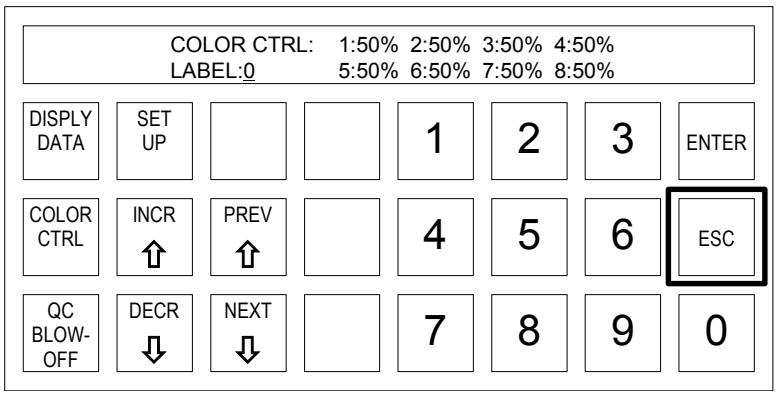
1) With the "Color Control" menu displayed, press the "NEXT" or "PREV" keys to place the cursor at the "Label" field.



2) Use the numeric keypad or the "INC" or "DEC" keys to select the current label number.



3) The label number is now set. Press the "ESC" key to return to the main display.

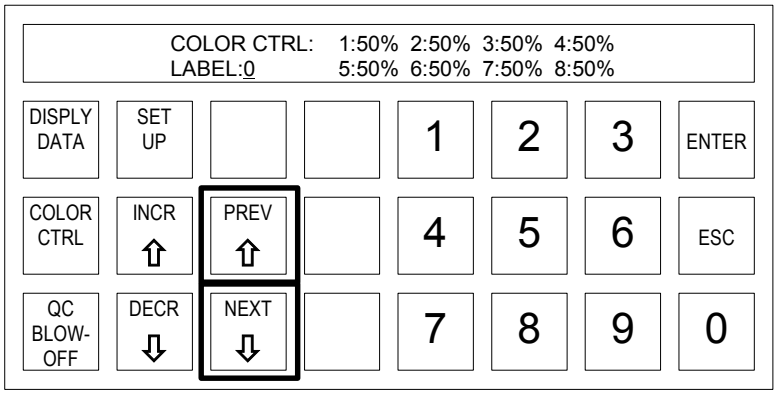


SECTION 4.2
SET / ADJUST DUCTOR %COLOR

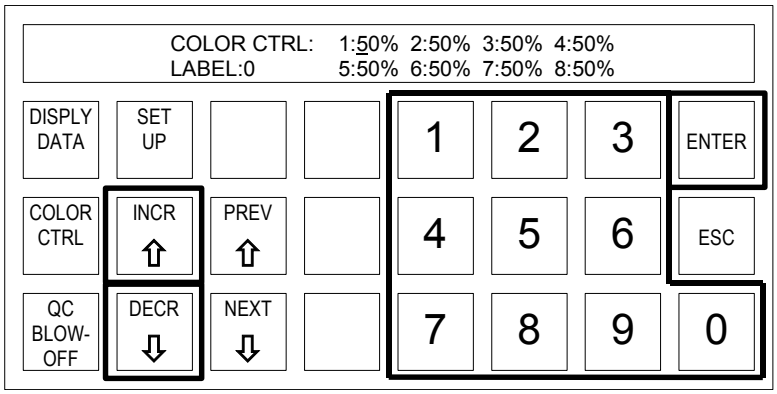
The %Color adjustment is used to vary the amount of time the ductor roll is in contact with the fountain roll. The ductor ON duration is the color control percent color of the maximum ON duration.

To set / adjust the "%Color", perform the following:

1) With the "Color Control" menu displayed, press the "NEXT" or "PREV" keys to place the cursor at the desired ink station field.



2) Use the numeric keypad or the "INC" or "DEC" keys to adjust / select the percent color for each ink station.



3) The %Color for each ink station is now set. Press the "ESC" key to return to the main display.