Maple Systems Filler Controller Operations Manual (Overflow Filler)

V1.1 (CC_1484)

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1.1 SAFETY

1.2 GENERAL SAFETY

Chadam Consultants, Inc. (CHADAM) manufactures and designs all of its products so they can be operated safely. However the primary responsibility for safety rests with those who use and maintain these products. The following safety precautions are offered as a guide that

if conscientiously followed, will minimize the possibility of accidents throughout the useful life of this equipment. The safety of personnel, equipment and plant facilities should be considered during equipment operation and with each changeover of product, or any machine modifications.

Only those who have been trained and delegated to do so and have read and understood this operator's manual should operate the equipment. Failure to follow the instructions, procedures and safety precautions in this manual can result in accidents and injuries.

DO NOT modify the equipment except with written factory approval. Unauthorized equipment modifications will void any warranty.

Each day walk around the equipment and inspect for leaks, loose parts, missing or damaged components, and parts out of adjustment. Perform all recommended maintenance noted in this manual.

EQUIPMENT SHOULD <u>ALWAYS</u> BE DE-ENERGIZED (POWER AND AIR) BEFORE MAKING MECHANICAL ADJUSTMENTS.

1.3 ELECTRICAL SHOCK

To avoid electrical shock hazard, make sure this equipment is properly grounded.

Dangerous voltages are present within the electrical enclosures. DO NOT operate this equipment with electrical covers open or removed.

Keep all parts of the body, hand held tools, or other conductive objects away from exposed live-parts of the electrical system. Maintain dry footing and stand on insulating surfaces. DO NOT contact any portion of the equipment when adjusting or making repair to exposed live parts of electrical system.

Attempt repairs only in a clean, dry, well-lighted, and ventilated area.

1.4 CONTACT MATERIALS COMPATIBILITY

CHADAM endeavors to make all contact parts compatible with buyer's products, if known. Because of the wide variety of possible products, Chadam Consultants, Inc. cannot be responsible or liable for ensuring compatibility of contact material with the products. Evaluate material compatibility prior to machine use. Failure to follow this procedure can result in machine damage, fire, operator injury or death

1.5 SAFETY COMPLIANCE LIABILITY

CHADAM endeavors to make machinery as safe to operate as possible. National, state and local laws related to safety in the workplace apply primarily to the responsibilities of the employer, and not the equipment manufacturer. The seller agrees to cooperate with the buyer in finding feasible answers to compliance problems. However, because CHADAM has little control of the many factors which may significantly affect the environment in which this equipment is installed, the seller does not warrant this equipment to be in compliance with

OSHA or any like state or local laws or regulations. It is the buyer's responsibility to provide the modifications necessary to assure compliance with the laws and regulations at the point of installation.

A complete inspection of product is necessary until the machinery is proven to produce acceptable results. This should also be performed after every changeover.

1.6 CONVENTIONS

To ensure the safety of personnel which will install, adjust, maintain and operate this equipment, it is imperative that they understand the dangers, warnings and caution notices. It is important to understand the ***signal words*** that may be used throughout this manual.

	Alerts to immediate hazard, which will result in death or severe personal injury, if not avoided
	Alerts to a hazard which will result in serious injury, or death in some cases, if not avoided.
	Alerts to a potential hazard that may result in a serious personal injury, if not avoided. It also alerts against an unsafe practice that will permanently damage equipment or property.
	Indicates a suggestion as to how to use or adjust the equipment for best product results.
	Points out a proper use that will avoid damage to the equipment, or will extend the life of the parts.

2.1 MAIN SCREEN

2.2 MAIN SCREEN

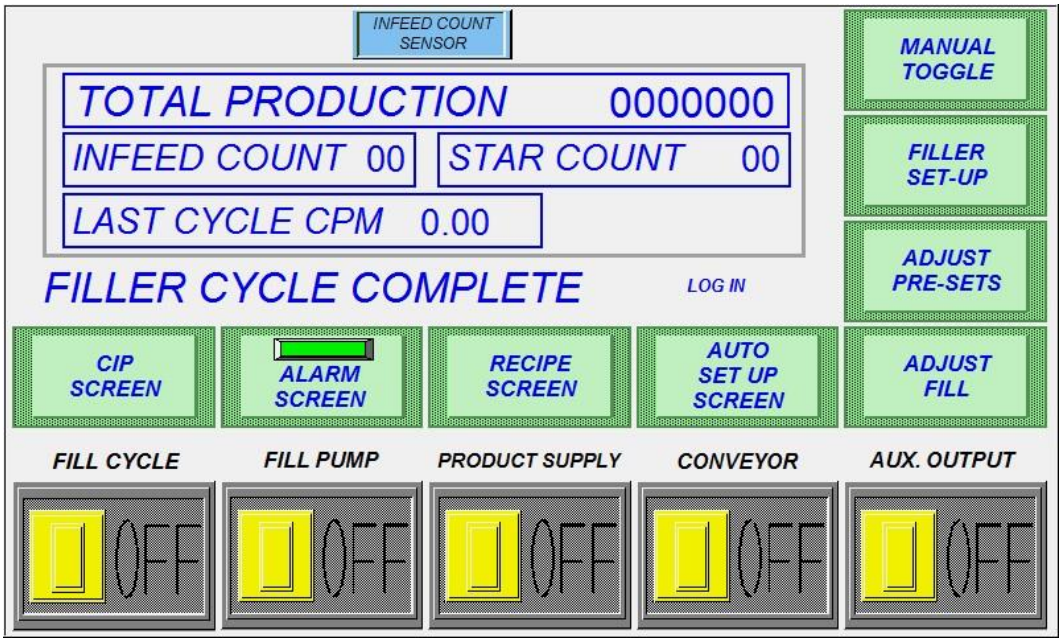

Figure 2-1
Main Screen

The main screen of the controller provides the primary filler function status at a glance.

At the top of the screen, the TOTAL PRODUCTION window tracks the machine's overall container output.

- INFEED COUNT displays the containers sensed by the infeed sensor.
- STAR COUNT displays the pins on the starwheel counted by the proximity sensor.
- LAST CYCLE CPM displays the containers per minute which the machine achieved on the previous cycle

Below the counters is a quick glance cycle status (*Fig 2-1* shows FILLER CYCLE COMPLETE)
(This will change during the fill cycle to read: FILLER IN CYCLE)

Along the bottom of the main screen, the five toggle switches may be pressed to quickly enable or disable various functions of the filler.
These toggle switches are available from most of the screens:

- **FILL CYCLE** enables or disables the entire filling cycle
- **FILL PUMP** enables or disables the overflow pressure pump
- **PRODUCT SUPPLY** enables or disables the product supply system
- **CONVEYOR** enables or disables the conveyor control
- **AUX OUTPUT** enables or disables specific optional outputs

(machine specific)
This output can be used for a wide variety of applications, providing an additional output signal to trigger auxiliary functions

Touching the remaining (green) buttons on the screen accesses the various programming and manual operation functions of the controller, described in the following sections:

Section	Subject
3.1	MANUAL TOGGLE
4.1	FILLER SET-UP
5.1	ADJUST PRE-SETS
6.1	ADJUST FILL SCREENS
7.1	AUTO SET-UP SCREEN
8.1	RECIPE SCREEN
9.1	ALARM SCREEN
10.1	CIP (CLEAN-IN-PLACE) SCREEN

Please Note: The Maple Systems Multi-Function Filler Control is designed to be used in a wide variety of applications. Some of the following information may, or may not, apply to your specific machine, for instance:

- *Semi-Automatic machines (slide track, no automatic conveyor) or shuttle based indexing machines (such as molten fillers) will not typically utilize any of the indexing features (entry and exit gate or starwheel settings)*
- *Stationary Fill Head machines will not utilize the diving head features*
- *Pressure/Gravity machines will not have any of the pump or pulse count parameters*
- *Automatic machines with pin indexing will not utilize the starwheel controls*

3.1 MANUAL TOGGLE SCREEN

3.2 MANUAL TOGGLE SCREEN

The manual toggle screen allows the operator to operate the various functions of the filler individually. This screen is primarily accessed for use during the initial machine setup, for performing mechanical calibrations, or for clearing a container jam. In some situations, certain modules may need to be bypassed for proper operation.

Please note: the multi-function controller is a versatile controller, capable of controlling a wide variety of machine configurations and options. Your machine may, or may not utilize any or all of the options listed on this screen, and screen layouts may differ from those shown throughout this manual

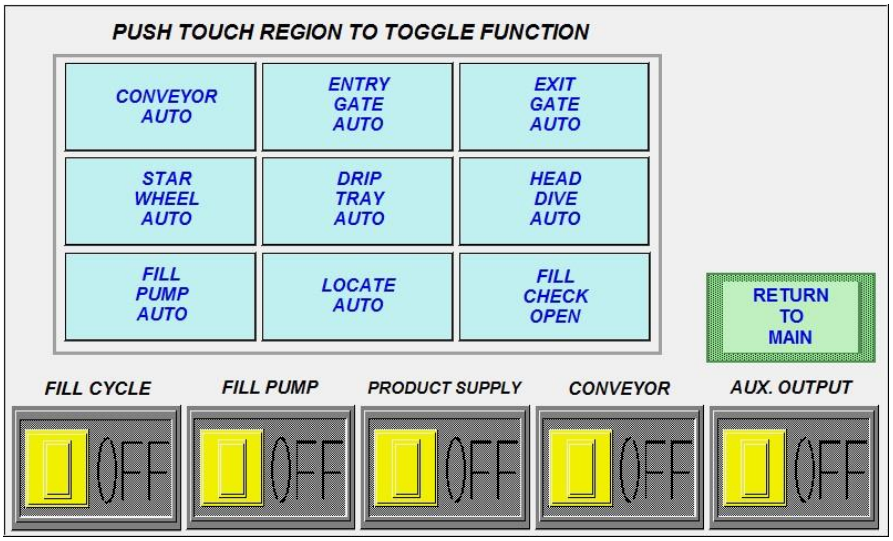

Figure 3-1 Manual Toggle Screen

The blue buttons act as toggle switches, activating the associated module:

- CONVEYOR (AUTO or RUN CONTINUOUS)
  Activating this toggle will bypass the conveyor controls, allowing the conveyor to either run for indexing, and stop during filling (AUTO) or to run continuously (RUN)
- ENTRY GATE (AUTO or OPEN)
  Activating this toggle will bypass the entry cylinder pin/gate controls, allowing the entry cylinder to either open and close for standard pin indexing (AUTO) or to remain open (OPEN)
- EXIT GATE (AUTO or OPEN)
  Activating this toggle will bypass the exit cylinder pin/gate controls, allowing the exit cylinder to either open and close for standard pin indexing (AUTO) or to remain open (OPEN)
- STAR WHEEL (AUTO or RELEASE)
  Activating this toggle will either activate the starwheel for automatic operation (AUTO), or remain released to allow containers to move through the fill area.
- DRIP TRAY (AUTO or RETRACT)
  Activating this toggle will bypass the drip tray controls, allowing the drip tray to either automatically extend during an indexing cycle, and retract during the fill cycle (AUTO) or to remain retracted for the entire filling and indexing cycles (RET)
- HEAD DIVE (AUTO or DOWN)
  Activating this toggle will bypass the diving head controls, allowing the dive mechanism to either dive and raise automatically for applications which require diving head filling operation (AUTO) or to dive the nozzles manually (DOWN)
- FILL PUMP (AUTO or RUN)
  Activating this toggle will bypass the overflow fillhead pressure pump, either cycling or maintaining pressure to the nozzles (RUN)
- LOCATE (AUTO or EXTEND)

Activating this toggle will bypass the container locator controls, allowing the locators to either automatically extend during a fill cycle, and retract during an indexing cycle (AUTO) or to remain extended for the entire filling and indexing cycles (EXT)

- FILL CHECK (OPEN or AUTO)
  Activating this toggle to AUTO will open and close the check valve on the process pump which charges the fill manifold depending upon whether the process pump is on or off. Activating this toggle to OPEN will leave the check valve open continuously.

Pressing RETURN TO MAIN will display the MAIN SCREEN

4.1 FILLER SET-UP SCREENS

4.2 FILLER SET-UP SCREEN 1

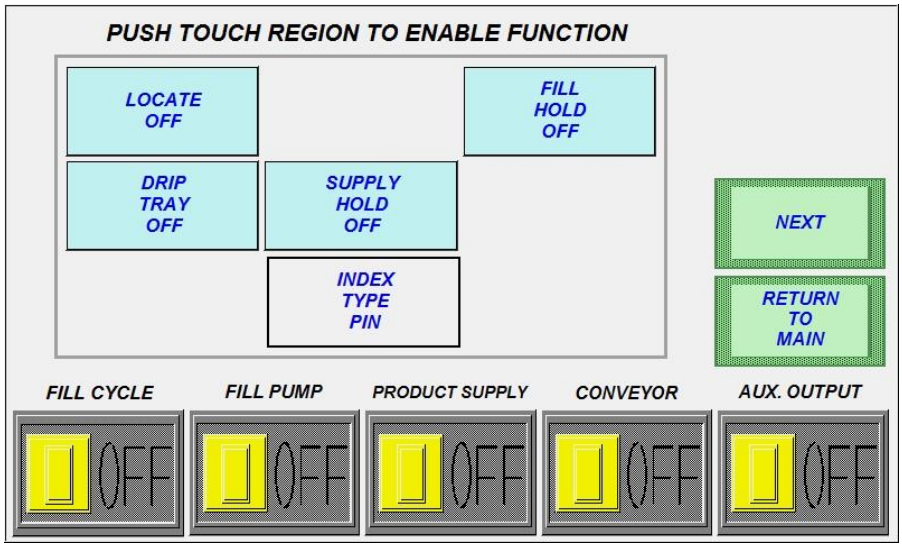

Figure 4-1
Filler Set-Up Screen 1

The first filler set-up screen allows the operator to enable or disable the primary filler options on the multi function controller. Some or all of these options may not be available on the screen, depending upon the filler configuration.

LOCATE (OFF or AUTO) Enables or disables the container locators

FILL HOLD (OFF or ON) Enables or disables the fill hold option. If enabled, filler will wait until float is satisfied before next cycle

DRIP TRAY (OFF or AUTO) Enables or disables the drip tray option

SUPPLY HOLD (OFF or ON) If set to ON, delays the hopper supply from being replenished until the fill cycle is completed, regardless of the product level sensor signal

INDEX TYPE (PIN, STAR or NONE) sets the type of indexing for which the machine is equipped to run \

Pressing NEXT advances to FILLER SET-UP SCREEN 2

Pressing RETURN TO MAIN will return to the MAIN SCREEN

4.3 FILLER SET-UP SCREEN 2

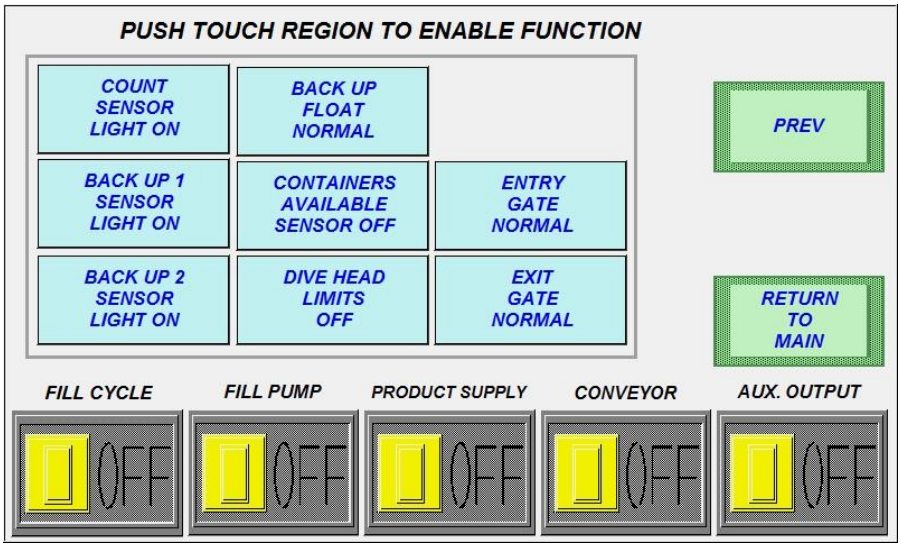

Figure 4-2
Filler Set-Up Screen 2

The second filler set-up screen allows for the operator to change the type of sensor used for the COUNT, BACK UP 1, and BACK UP 2 sensors. This allows use of both LIGHT ON and DARK ON sensors.

BACK UP FLOAT (NORMAL or INVERT) Sets the type of Back Up Float Sensor used

CONTAINERS AVAILABLE SENSOR (OFF or ON) Enables or disables the use of a container available sensor

DIVE HEAD LIMITS (OFF or ON) Enables or disables the use of Dive Limiting Proximity Sensors or Switches

ENTRY & EXIT GATE (NORMAL or INVERT) Depending upon the configuration of the pneumatic tubing connected to the Entry & Exit Gates, it may be necessary to toggle from Normal to Inverted for proper operation.

Pressing PREV will return to Filler Set-Up Screen 1

Pressing RETURN TO MAIN will display the MAIN SCREEN

5.1 ADJUST PRE-SETS SCREENS

5.2 ADJUST PRE-SET SCREEN 1

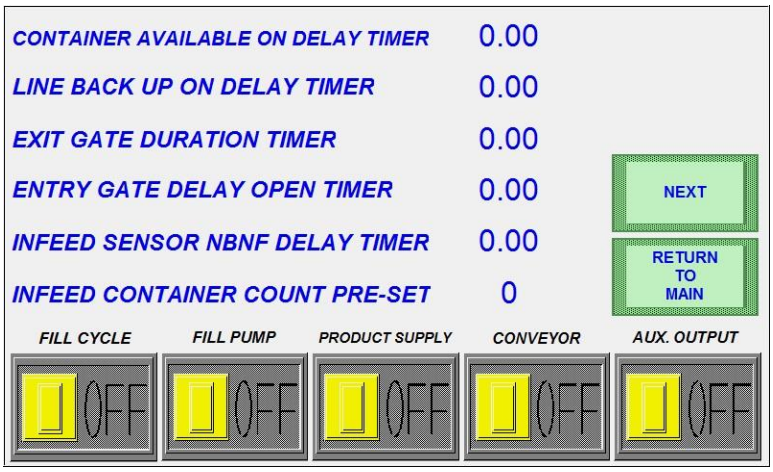

Figure 5-1
Adjust Pre-Set Screen 1

Fig 5-1a

Numeric Entry Pad

The main pre-set adjustment screen allows the operator to adjust the various parameters of the indexing and filling cycle. Touch the numerals to display a popup numeric entry window, shown in Fig 5-1a.

CONTAINER AVAILABLE ON DELAY TIMER: Time which the container available sensor must sense a container before filling will start

LINE BACK UP ON DELAY TIMER: Time which the back up sensor must be blocked before the filler will halt production

EXIT GATE DURATION TIMER: Time the exit gate remains open to allow full containers to exit the fill area

ENTRY GATE DELAY OPEN TIMER: Time the entry gate waits to open after the exit gate opens (creates a gap between exiting full containers and entering empty containers)

INFEED SENSOR NBNF DELAY TIMER: (No Bottle, No Fill) The infeed sensor must detect a container for this period of time before a fill cycle will begin

INFEED CONTAINER COUNT PRE-SET: The number of containers the machine is required to count to ensure the fill area is full

Pressing NEXT will advance to the Adjust Pre-Set 2 screen

Pressing RETURN TO MAIN will display the MAIN SCREEN

5.3 ADJUST PRE-SETS SCREEN 2

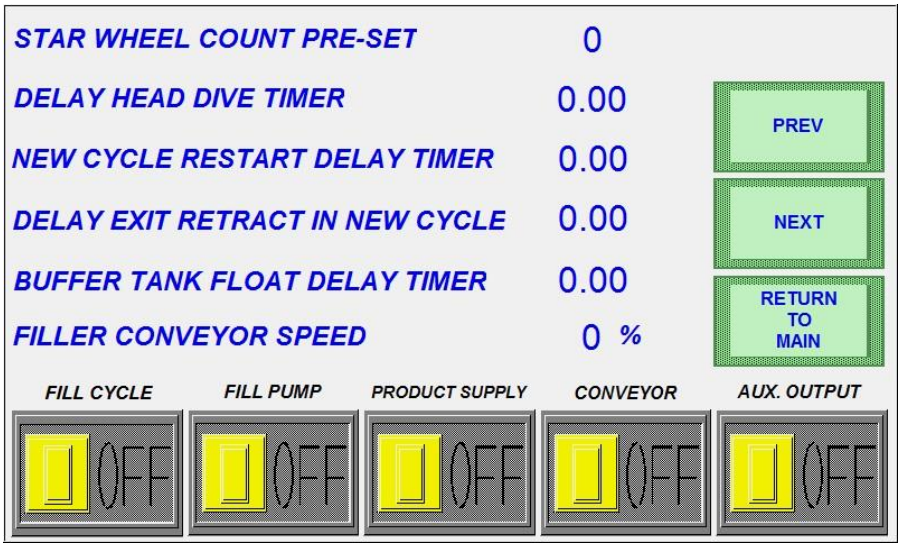

Figure 5-2
Adjust Pre-Set Screen 2

STAR WHEEL COUNT PRE-SET: The amount of pins which the starwheel sensor will count to determine a full indexing is completed

DELAY HEAD DIVE TIMER: The amount of time the diving heads will delay after the entry count (or starwheel count) and any entry delays (NBNF timer, for example) have expired

NEW CYCLE RESTART DELAY TIMER: The amount of time the machine will delay continuing filling after the fill cycle has finished

DELAY EXIT RETRACT IN NEW CYCLE: The amount of time the machine will wait to retract the exit cylinder after the fill has finished (helpful if additional time is needed for the nozzles to fully retract out of the containers, for instance)

BUFFER TANK FLOAT DELAY TIMER: This timer helps avoid "chattering" in the supply, or hopper, tank by delaying the product supply, from the time the float calls for product until the product supply begins to replenish the hopper tank. This is typically utilized when the total fill volume is small compared to the hopper capacity.

FILLER CONVEYOR SPEED: The percentage of the conveyor's full speed which it will run when cycling

Pressing NEXT will display ADJUST PRE-SET SCREEN 3

Pressing PREV will display ADJUST PRE-SET SCREEN 1

Pressing RETURN TO MAIN will display the MAIN SCREEN

5.4 ADJUST PRE-SETS SCREEN 3

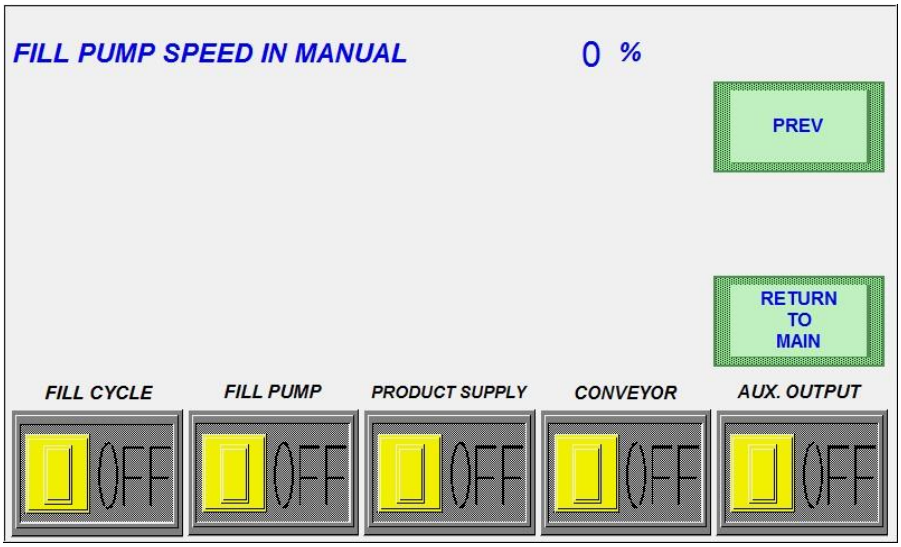

Figure 5-3
Adjust Pre-Set Screen 3

The third and final ADJUST PRE-SET SCREEN allows the operator to adjust the fill process pump speed as a percentage of full speed, while running the pump in manual mode.

When the machine is in automatic mode, the pump speed parameters will be controlled as described in the following Section 6.1.

Pressing PREV will display ADJUST PRE-SETS SCREEN 2

Pressing RETURN TO MAIN will display the MAIN screen

6.1 ADJUST FILL SCREENS

6.2 ADJUST FILL SCREEN 1

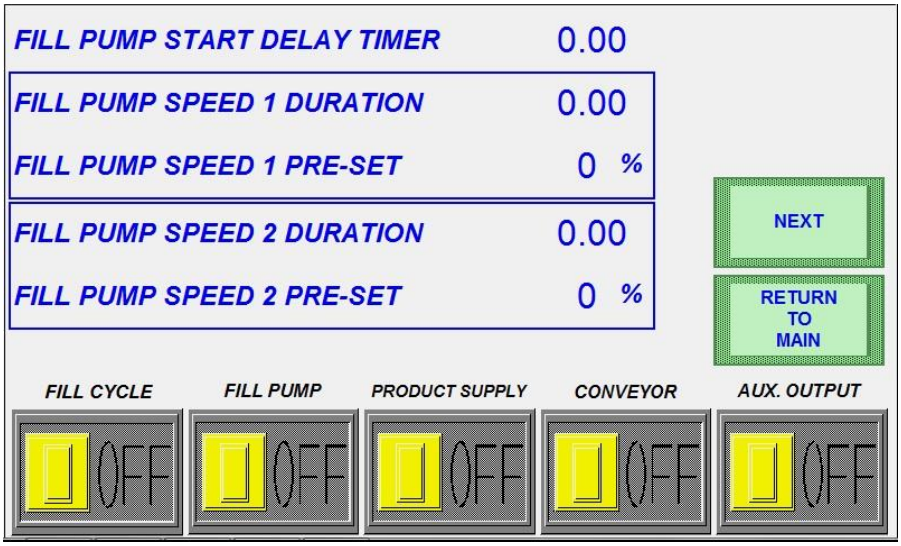

Figure 6-1
Adjust Fill Screen 1

The first Adjust Fill Screen allows the operator to finely tune the fill process pump speeds during the fill cycle as described below.

FILL PUMP START DELAY TIMER: This timer will delay the pump from starting immediately when the fill cycle begins. This allows time for the nozzles to dive into the containers fully, or finishing other processes before pressurizing the fill manifold.

The fill manifold pressure can be altered by setting the following parameters: FILL PUMP SPEED 1 DURATION (the amount of time the fill should start at the following speed), FILL PUMP SPEED 1 PRE-SET (the speed which the fill pump should start to fill containers), etc.

The fill parameters are able to be fine tuned further on the following screen.

By pressing NEXT, the ADJUST FILL SCREEN 2 is displayed

By pressing RETURN TO MAIN, the MAIN screen will be displayed.

6.3 ADJUST FILL SCREEN 2

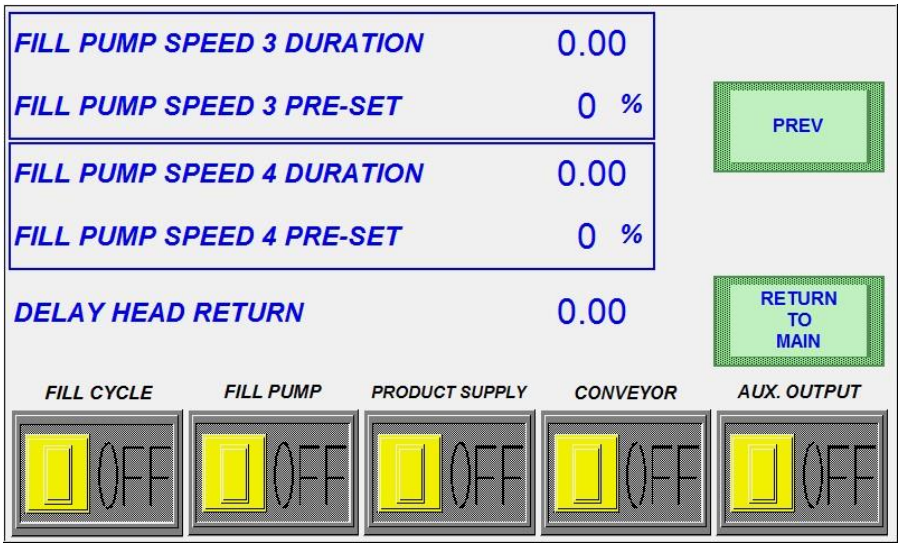

Figure 6-2
Adjust Fill Screen 2

Similar to the first ADJUST FILL SCREEN, the second fill screen adjustment timers allow the operator to further fine-tune the fill parameters per cycle.

In addition, DELAY HEAD RETURN timer is provided to allow the fill cycle to “settle” before the heads raise, allowing the pump to cycle off, release pressure in the containers, and allow excess product to flow through the nozzle product return lines.

7.1 AUTO SET-UP SCREEN

7.2 AUTO SET-UP SCREEN 1

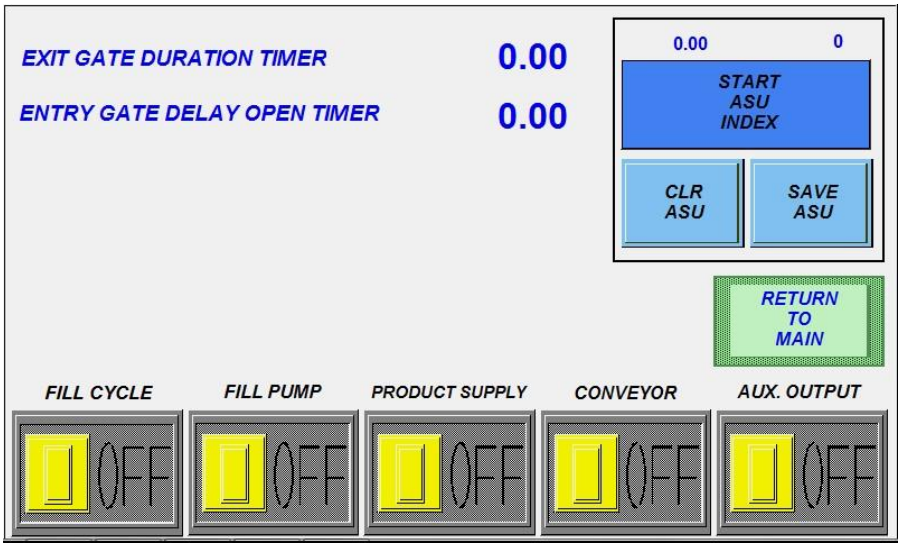

Figure 7-1
Auto Set-Up Screen 1

This screen allows the operator easy access to setup indexing parameters by utilizing real-world results.

(OPTIONAL Toggle buttons) allow the operator to activate components such as:

- Drip Tray (AUTO or RET) Automatic or Retracted
- Head Dive (AUTO or DOWN) Controls the diving head
- Locate (AUTO or EXT) Controls the neck locators

Basic sequence of ASU indexing setup (pin indexing):

1. Ensure the entry and exit gates are properly aligned in the fill area and the guide rails are set properly
2. Ensure the count eye is accurately reading containers
3. Set up sufficient containers to fill the fill area plus any additional containers necessary to reach the count eye
4. The containers should be set up-line from the entry gate, and the fill area should be clear of containers
5. Press START ASU INDEX to activate the conveyor, the entry gate will open, and the count eye will read the containers
6. When the count eye has read the proper number of containers, the indexing ASU has finished
7. Press SAVE ASU

Basic sequence of ASU indexing setup (starwheel indexing):

1. Ensure the guide rails are set properly, and the starwheel is properly aligned, able to move freely
2. Ensure the starwheel count eye/prox is reading properly
3. Set up sufficient containers to fill the fill area plus enough containers to index a full cycle into the fill area. Additional containers may be necessary to provide proper back pressure
4. Press START ASU INDEX to activate the conveyor and release the starwheel
5. When the starwheel count eye has read the proper number, the indexing ASU has finished
6. Press SAVE ASU

Pressing RETURN TO MAIN will display the MAIN SCREEN.

8.1 RECIPE SCREEN

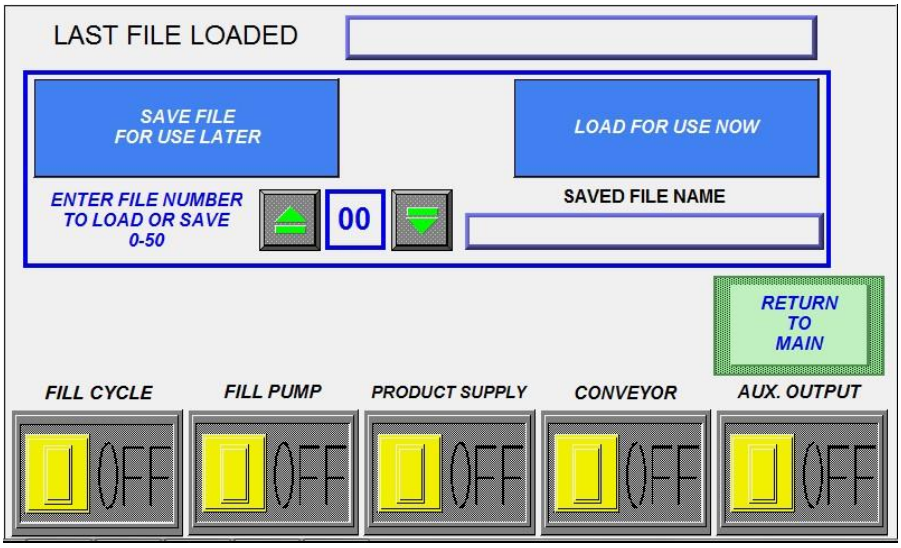

Figure 8-1
Recipe Screen 1

8.2 RECIPE SCREEN 1

This screen allows the operator to save or load all of the timers (indexing and filling) which are specific to different containers or setups.

Pressing directly on the numeral will pop up the numeric entry window as seen in *Fig 8-1a.* Press the desired address (0-50) and either save or load the data by pressing the associated button.

Once the address is chosen, the HMI will prompt for a friendly name by which to save the recipe, through the popup on-screen keyboard as shown in *Fig 8-1a & Fig 8-1b.*

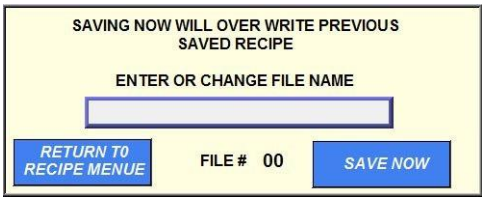

Fig 8-1a ***Recipe Naming***

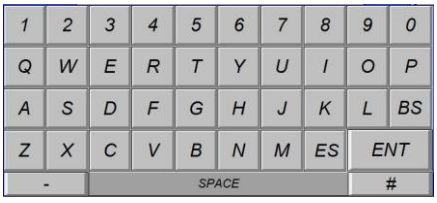

Fig 8-1b ***Keyboard***

Either press RETURN TO RECIPE MENU to return to the selection screen or press SAVE NOW to chose an appropriate name for the recipe.

Pressing RETURN TO MAIN will display the MAIN SCREEN

It is good practice to keep a record of the saved programs for easy reference. The table on the following page is provided for convenience:

Address	Description

9.1 ALARM SCREEN

9.2 MAIN ALARM SCREEN

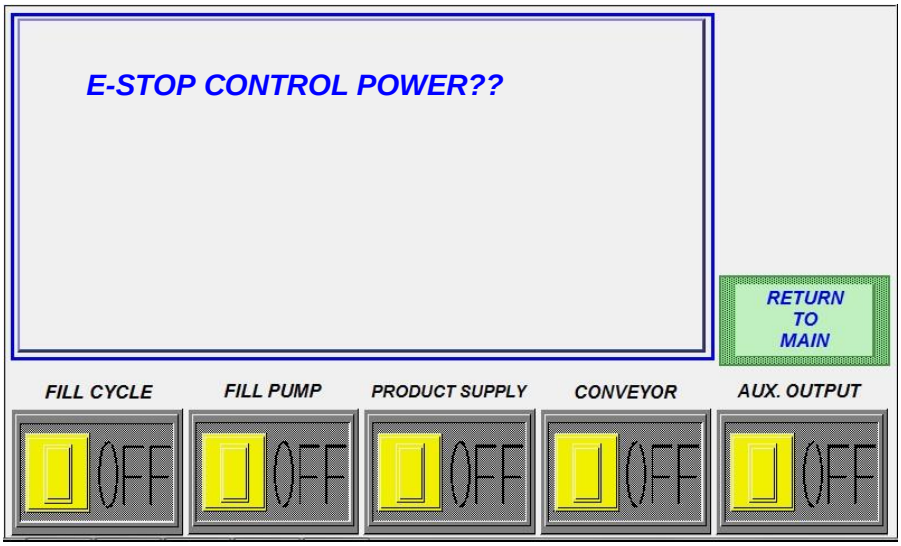

Figure 9-1
Alarm Screen 1

This screen will display common faults that will be necessary to clear before the filling cycle can continue. While the fault list will vary by application, a list of the common faults is as follows:

LOW TANK LEVEL/ LOW PRODUCT LEVEL IN TANK: This indicates that the buffer tank has not fully recovered (i.e. the float continues to call for product although the next cycle has started) Check the product supply system.

BUFFER TANK FLOAT FAULT/FLOAT FAIL: This indicates that the back-up float has been activated. Shut off the supply and check the buffer tank to determine why the product is overflowing (or if the back-up float is malfunctioning (poor sensor, mechanically stopped, etc)

LINE BACK UP/ ZONE 1,2,3: This indicates that a backup sensor in the associated zone is blocked. Clear the zone or adjust the sensor, as necessary

E-STOP CONTROL POWER ??: This indicates the E-Stop has been pressed, the power has been lost, or a fuse has blown. Check and rectify as necessary

CHECK STAR WHEEL POSITION: This indicates that the starwheel sensor is not sensing properly, or is out of position. Check and rectify as necessary

LOW CONTAINERS AT INFEED: This indicates there are not sufficient containers up-line for proper operation. Check sensor position, or containers available, and rectify as necessary

LOW AIR PRESSURE: Pressure sensor does not sense proper air pressure, or indicates problem with sensor

ADDITIONAL TROUBLESHOOTING NEEDED:

PUMP DRIVE FAULT: Problem indicated with supply pump drive motor. Check drive convertor, motor for seize condition, or false overload.

AC DRIVE FAULT: Problem indicated with AC Drive Motor (typically for supply pump or conveyor drive)

MOTOR OVERLOAD TRIP: Typically refers to pump drive, but can be for an auxiliary motor, which has overloaded, check drive alignment/proper pump operation

10.1 CIP SCREEN

10.2 MAIN CIP (CLEAN-IN-PLACE) SCREEN

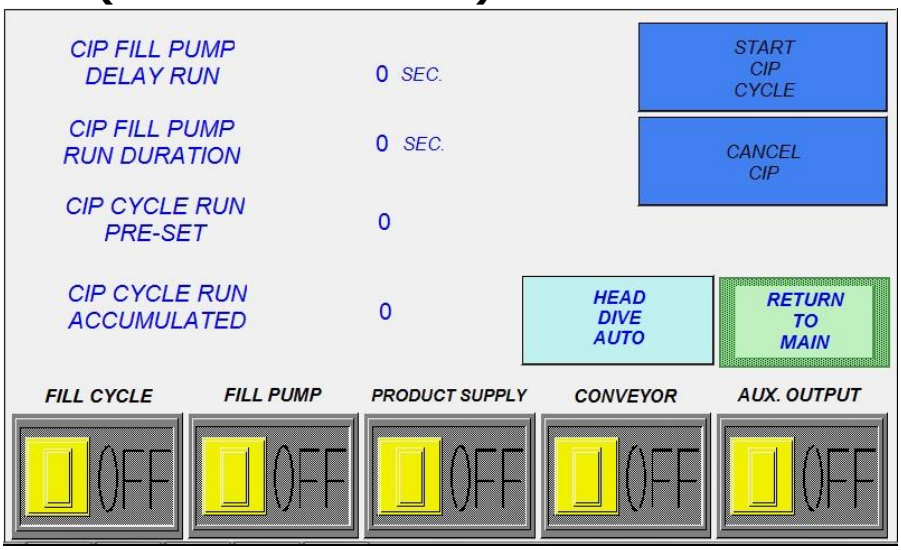

Figure 10-1
Main CIP Screen

The Clean In Place Screen displays the various programmable parameters for the CIP system and displays the number of CIP cycles completed (when using the CIP Cycle Run)

CIP FILL HEADS DELAY OPEN: This timer controls how long the fillheads will remain closed between cycles CIP

FILL HEADS DURATION OPEN: This timer controls how long the fillheads will remain open between cycles

CIP CYCLE RUN PRE-SET: This counter allows the operator to set a how many cycles the filler will run

CIP CYCLE RUN ACCUMULATED: This displays the number of CIP cycles currently completed

Pressing START CIP CYCLE will start the Clean In Place cycle up to the Pre-Set cycles

Pressing CANCEL CIP will stop the Clean In Place cycling Pressing RETURN TO MAIN will display the MAIN SCREEN