Flex OPL

Example Flex OPL installation:
- *Base Unit (#7550000)*
- *500 Series pumps (#7550014)*
- *SIB module (#7550020)*
- *Remote (#7550011)*

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Equipment Ratings

This includes equipment supply, description of I/O connections, duty cycle and operating environmental conditions.

1. Pollution degree 2;
2. Installation category 2;
3. Altitude 2000 m;
4. Humidity 50% to 80%
5. Power supply 100 - 240 VAC, 2.0 A, 50/60 Hz
6. Indoor use only;
7. Temperature 5°C to 40°C;
8. Mains supply voltage fluctuations are not to exceed 10 percent of the nominal supply voltage;

Electrical Ratings

- Chemical dispensing pumps, Models Flex OPL, permanently connected, rated 100 - 240 VAC, 2.0 A, 50/60 Hz
- Replacement on I/O Board: 2Amp, 250V, 6.3x32mm, Fast-Acting
- Replacement on PCB inside SIB Module: 0.5Amp, 250V, 6.3x32mm, Fast-Acting

CAUTION: Wear protective clothing and eyewear when dispensing chemicals or other materials. Observe safety handling instructions (MSDS) of chemical mfrs.

CAUTION: To avoid severe or fatal shock, always disconnect main power when servicing the unit.

CAUTION: When installing any equipment, ensure that all national and local safety, electrical, and plumbing codes are met.

PRE-INSTALLATION

Before the equipment is installed, you should survey the installation site thoroughly. At the very least, your survey should include the following:

- Check to make sure that all functions of the washmachine are operating properly. Including; card reader or timer, water solenoids, flush down valves, water level switch, machine motor, and drain valve.
- Check the proposed location for a 100 to 240 V power source.
- Check voltage of all supply signals from the washmachine. Measure voltage between supply signal and signal common with a voltmeter. DO NOT check signal voltage between supply signal and case (earth) ground.
- Measure the distance from chemical supply containers to pump housing, and from pump housing to injection point inside washmachine.

INSTALLATION

(1) Disconnect all power to washer.

(2) Using the provided joggle bracket, mount the pump cabinet in a convenient location no higher than 8' above, and within 10' horizontally, of supply containers. This is usually near the washer, however the dispenser can be mounted as a remote pumping system.

(3) Using the provided Dual-Lock fastening strips, mount the **Remote Control** to the front of the washer where operators can easily access it (be sure to first clean the mounting surface as the adhesive will not stick to a dirty surface). Connect the low voltage cable from the remote to the pump cabinet.

(4) Connect 100 to 240 V power source to main power connection in pump cabinet. Use suitable conduit for electrical wiring (per applicable wiring codes). A suitable ground conductor should be connected to the ground terminal in accordance with local electrical codes. The user/installer should provide a disconnect switch or circuit breaker close to the equipment and should be marked that it is for this equipment.

(5) Install and wire the **Signal Interface Module** (SIB) per section below. Low voltage cables do not require conduit.

(6) If using a flush manifold, connect the flush solenoid to the proper terminals on the circuit board as shown in the wiring diagram. Also connect the flush error switch if used. A water supply connection to the manifold is also required and should be connected with regard to local plumbing regulations.

(7) For each pump, cut the suction tube to length and insert one end into the appropriate supply container using PVC pipe as a support. Insert other end of suction tube into the left (input) side of the pump's squeeze tube.

(7) For each pump, cut the discharge tube to length and insert one end into the right (output) side of the pump's squeeze tube. Form an anti-siphon loop (pointing "down") with the other end of discharge tube and insert into the supply pocket of the machine. If using a flush manifold, connect each pump to the manifold checkvalves.

(8) The system is now ready to be powered up and programmed.

The Signal Interface Module (SIB):

The SIB receives supply signals from the washer, then communicates with the dispenser to run the pumps. The low voltage cable allows a quick, clean connection from the module to the pump system without requiring conduit.

(1) Mount the module using the provided Dual Lock adhesive strip. The module can be mounted inside the washer's controls, along side the washer's controls, or to the bottom of the pump cabinet.

(2) Connect the low voltage cable from the module to the Flex OPL remote control.

(3) Connect the supply signals to the SIB per wire colors on the SIB label. If using Drain Mode, only one signal is required (pump #1). See the notes below for signal common connections.

- COM A on the SIB is for pumps 1-5 and COM B is for pumps 6-10.
- If you have only one signal common (typical) connect the common to COM A and also COM B if using pump 6 or higher.
- If you have two signal commons, connect the first common for pumps 1-5 to COM A and the second common for pumps 6-10 to COM B.
- Do not ever connect the SIB to two separate washing machines. The split common capability of the SIB is intended for single washer applications that have different commons for different groups of supply signals.

OPERATION

NOTE: Do not run more than 3 pumps at a time in any of the operating modes listed below.

❑ **NORMAL MODE:** The system is capable of 30 user selectable formulas with each formula having unique volumes and delay times for each pump. Signals from the washer trigger the pumps, then the Flex OPL microprocessor takes control to count down delay times and run times with up to 3 individual “levels” (explained below) for each pump. The supervisor of the facility, or the machine operator, will select the formula using ▲/▼ buttons to choose the appropriate wash formula.

Programming "levels" allows a pump to inject different amounts of chemical for multiple signals to the same pump during a formula. For example, pump 1 could inject 8 ounces of chemical on its first signal, then later inject 12 ounces of chemical on its second signal. Three levels are available for any pump on any formula, except for the load count pump. ONLY 1 LEVEL CAN BE PROGRAMMED FOR THE LOAD COUNT PUMP (and any other pump that may be signaled simultaneously with the load count pump's signal). The level feature can also be used to “skip over” an injection. Simply do not program any volume or delay time for that level.

When a formula begins (after power is turned on or the “Load Count” pump has been triggered from the previous formula) the first signal to a pump will activate level 1. The signal has to be present for at least 5 seconds to be recognized. The second signal to the pump during the formula will activate level 2. The third signal to the pump during the formula will activate level 3. The load count pump signal must be received to reset levels in preparation for the next formula.

❑ **DRAIN MODE:** This mode is similar to normal operation but requires only one signal source from the washer and works by counting the number of drains during a wash cycle. When programming the dispenser for Drain Mode use, each chemical pump is assigned a specific drain occurrence (“drain count”) to inject product on. This feature only affects how the pumps are triggered – all other functions such as pump volumes, delay times, and flush mode, will still operate in their normal fashion.

During a wash formula, each drain signal is counted and the pumps inject chemical according to the drain number they are assigned. Drain mode is similar to normal operation, in that the pumps are programmed with volumes (and delay times if necessary) and the flush mode works the same way it does in normal operation.

The “multiple level” feature works slightly different in drain mode, because of the way drain mode counts the number of signals to pump #1 input. If a second injection level is required, it must be programmed to inject on a later drain number (occurrence) than the first level for that pump.

- Using signal lockout is not recommended for drain mode operation.
- During a washcycle, when pumps are idle, the display will show the formula name on the top line and the current drain count on the bottom line. When the washcycle ends, the drain count will show 00.
- Cycling power will reset the drain count if an incomplete load has been run.

❑ **RELAY MODE:** This type of operation is typically used with a microprocessor controlled washer. When set to relay mode, the system will run pumps as long as their respective signals are present. To accomplish this, the system “by-passes” its volume and delay time capabilities for the chemical pumps; however, flush mode is still available for optional use. The signal lockout and system lockout features are not recommended for relay mode operation.

❑ **AUTO FORMULA SELECT (AFS):** This is an optional feature that allows the washer to select the formula that will be selected using a dedicated signal from the washer.

MICRO: For use with microprocessor controlled washers that can send a signal of exact duration to the unit. The controller interprets the duration of the signal as the formula number requested, based on the AFS TIME setting.

CHART: For use with card-reader type machines. Uses a combination of signals to pick the formula in a “binary” numbering format. The auto formula select signal must be applied for a minimum of 30 seconds.

AFS PUMP: This is the pump signal input that will be used for the auto formula select feature. Choose an “unused” pump input (i.e. one that is not used to trigger a chemical injection).

AFS TIME: Used in micro mode to establish a time “increment” for selecting formulas. The signal duration will be divided by the number selected to choose the formula. Signal time increments (in seconds) are 1—5. Example: If AFS signal time is set for 2, a 20 second signal from the washer would choose formula 10 on the dispenser.

KEYPAD DIAGRAM

LED Colors (page 13)

- Amber – communication
- Green – power

Screen Colors

- Blue – idle (no cycle running)
- White – active cycle running
- Purple – programming
- Red – warning/alarm

BUTTON FUNCTIONS

	Allows you to choose the desired formula (unless using RELAY mode) for operation. When programming the system, allows you to change the value of a particular character (i.e. pump number, formula name, etc). A blinking “cursor” indicates which character will be changed by these buttons. Press repeatedly to advance through all available letters and numbers. The ▲ button also acts as a YES response for menus that have YES / NO prompts.
	Allows you to move the cursor position left or right within certain menu selections to choose items you wish to change. Also used to exit certain menu options or to exit the programming mode to return to normal operation.
	Allows you to access the system from the main (default) display. Takes you into the menus for programming. Logs data into memory when programming. Also acts as a NO response for menus that have YES / NO prompts.

PROGRAMMING

01 FORMULA 01 FLEX OPL KNIGHT LLC	All systems are shipped from the factory with the access code set at 000. Changing the access code is explained later in this manual. **To get started, hold the ENTER button until you see the following display (this should only take a few seconds).**
MAIN:V0.92 I/O:V0.10 ACCESS CODE 0000 ▲ 9520	Use the arrow buttons (not necessary if code has not yet been changed from factory default of 000) to input the access code, then press ENTER. You will then advance to the settings display screens as shown below.
LANGUAGE SAVE REPORT PRIME PUMPS CLEAR RPT DATA CLEAR LOAD COUNT UNIT OF MEASURE CALIBRATE PUMP	Use the ▲/▼ buttons to select the setting you wish to change then press ENTER. If you continue past the last setting shown on the display, you will advance to the next screen of settings. Press the left arrow button (◄) at any time to go back one step.
LANGUAGE ENGLISH	Use the ▲/▼ buttons to select the desired language (for the programming menus and running displays) then press ENTER.
MM / DD / YYYY START 01 01 2022 ▲▲ END01 31 2022	Insert a USB drive, then use the arrow buttons to select the report date range then press ENTER. The display will briefly flash “waiting for USB drive” then “report complete” and will advance to the following display.
REPORT COMPLETE 14 OF 99 DATA LOGS	This display will show the total number of data logs saved to the report. Press the left arrow to return to the settings display. The USB drive can now be removed.
PRIME PUMP-01 ENTER = START	Use ▲/▼ to choose the pump number, then press ENTER to start and stop the pump. When finished priming pumps press the left arrow to return to the settings display.
CLEAR RPT DATA ENTER = YES	Press ENTER to clear report data. This process will take about a minute to complete and is normal. When finished you will be returned to the settings display.

PROGRAMMING (CONTINUED)

CLEAR LOAD COUNT ENTER = YES	Press ENTER to clear load counts. This is only the digital counter on the keypad and separate from full report data. When finished you will be returned to the settings display.
UNIT OF MEASURE US	Use the ▲/▼ buttons to select the desired unit of measure (for pump volumes and calibrations) then press ENTER. You will then be returned to the settings display.
MANUAL CALIBRATE ENTER = YES ► = NO	Press ENTER if you wish to manually view, or change, pump flow rates, or press ► to auto-calibrate.
FLOW RATE PUMP-01 ▲ 0000.0 OZS/MIN	Use the ▲/▼ buttons to select the pump number and view the existing flow rate. Press ► to move the cursor to the bottom then use the ▲/▼ and ► buttons again to change the flow rate of the pump and press ENTER to confirm. Repeat as needed for other pumps, then ◄ to return.
CALIBRATE PUMP PUMP-01 ENTER = START	Use the ▲/▼ buttons to select the pump number and press ENTER to start the pump. Measure out the volume dispensed into a beaker or measuring cup. Press ENTER again and you will see the display below.
PUMP-01 000.0 OZS ▲	Use the ▲/▼ and ► buttons to input the number of ounces you measured in the previous step and press ENTER.
PUMP-01 0000.0 OZS/MIN 0000.0 MLU	The resulting flow rate will then be displayed for the pump that you just calibrated. Press ◄ to continue with calibrating other pumps. When finished, press ◄ to return.

PROGRAMMING (CONTINUED)

DISPENSER ID ACCESS CODE LOCKOUT TIME DELAY UNITS OPERATING MODE PUMP LEVELS LOAD COUNT PUMP	Use the ▲/▼ buttons to select the setting you wish to change then press ENTER. If you continue past the last setting shown on the display, you will advance to the next screen of settings. Press the left arrow button (◄) at any time to go back one step.

DISPENSER ID 00 ▲	This selection allows the dispenser id number to be changed. Use the ▲/▼ buttons to establish the new id number, then press ENTER.

MAIN USER 0000 0000 ▲ PRIM E ENABLED	The main access code allows entry into the programming menus whereas the user access code allows priming only. Use the ▲/▼ buttons to establish the access codes and user prime setting, then press ENTER.

SIGNAL LOCKOUT 00 MINUTES ▲ SYSTEM LOCKOUT 00 MINUTES	Signal lockout sets the time that the system will disregard incoming supply signals. The setting applies to all pumps except load count pump. System lockout sets the time that the system will be locked-out to all incoming supply signals. The lock-out time is started by a signal to the load count pump. Use the ▲/▼ and ► buttons to set lockout times then press ENTER.

DELAY UNITS SECONDS	This selection allows you to choose seconds or minutes as the delay time unit of measure. Use the ▲/▼ buttons to choose the desired setting, then press ENTER to continue.

OPERATING MODE NORMAL ▲ SIGNAL MODE ONE TO ONE	This selection allows you to choose between the following modes of operation: Normal, Drain, or Relay. You can also select one to one or assigned signal mode. Use the ▲/▼ and ► buttons and press ENTER..

OPERATING MODE DRAIN ▲ SIGNAL MODE NORMAL	NOTE: You will only see this display if Drain was selected as the operating mode. This selection allows you to select if the drain signal is to be NORMAL or INVERTED. Use the ▲/▼ buttons to make your selection, then press ENTER to continue.

OPERATING MODE RELAY ▲	NOTE: You will only see this display if Relay was selected as the operating mode. Pumps will automatically operate one to one and cannot be set to assigned signal mode.

PROGRAMMING (CONTINUED)

PUMP LEVELS ENABLED	This selection allows you to choose if you wish to use multiple pump level programming. Pump levels allow the pumps to dispense up to 3 individual dosage amounts within the same formula. Use the ▲/▼ buttons to choose either enable or disable, then press ENTER.

LOAD COUNT PUMP PUMP-06	This selection shows which pump is being used to count loads. Always enter the last pump in the system that will receive a signal. Use the ▲/▼ buttons to choose the number, then press ENTER. When finished, press ENTER to continue. IMPORTANT: The load count pump must receive a signal on every washcycle for the system to operate correctly (even if the load count pump will not actually dispense chemical for the formula selected). When the load count pump receives a signal, the load counter is incremented as well as resetting formula levels, and signal lockout in preparation for the next washcycle. This setting is critical when using Drain Mode to maintain proper injection sequence. Normally you will set the load count pump to correspond with the last drain signal that will be received during the formula, however there may be additional drain signals that occur after the last pump has injected. In this situation, a fictitious pump can be assigned to act as a load count pump.

FLUSH MODE SIGNAL TIME WASHER WEIGHT SHIFT TIMES AFS AUTO FORM RESET SET TIME/DATE	Use the ▲/▼ buttons to select the setting you wish to change then press ENTER. If you continue past the last setting shown on the display, you will advance to the next screen of settings. Press the left arrow button (◄) at any time to go back one step.

FLUSH MODE WITH ▲ SECONDS TIME ERROR 00 05	This selection sets how the flush mode operates (if a flush manifold is used). Use the ▲/▼ buttons to choose if the flush will happen <u>with</u> or <u>after</u> pump operation. SCROLL right to move the cursor to the bottom line and use ▲/▼ buttons to set the flush time and error time, then press ENTER. Flush time is how long the flush will continue running after any pumps have finished injecting to clear all chemical to the washer. If set to zero then the flush function is turned off. Error time is how long the optional flow switch can break contact before giving a flush error. If set to zero, then the function is turned off and the system will not monitor the flow switch terminals.

SIGNAL TIME 05 SECONDS	This selection allows you to determine the appropriate length of a valid supply signal from the washer. Supply signals must be of a duration that matches the minimum setting to activate any pump in the system, or start a pump delay. The range is from 1 to 10 seconds. To set the signal (qualify) time use the SCROLL and ▲/▼ buttons to establish the desired time, then press ENTER.

PROGRAMMING (CONTINUED)

WASHER WEIGHT 000 LBS ▲	This selection allows you to enter the load capacity for the wash wheel that the dispenser is presently connected to. Use the SCROLL and ▲/▼ buttons to establish the new washer weight, then press ENTER to log the data into memory. When finished, press ENTER to continue.
SHIFTS 1=06:00 ▲ 2=11:00 3=17:00	This selection allows you to enter the shift times. Shift times are entered on a 24 hour clock cycle (like military time). Use the SCROLL and ▲/▼ buttons to establish the new shift times, then press ENTER to log the data into memory. When finished, press ENTER to continue.
AFS PUMP MODE 10 MICRO ▲▲ AFS TIME 1 SECONDS	This selection allows you to choose which AFS settings will be used to select formulas. See the notes in the operation section (page 4) for details on how the modes work. Use the SCROLL and ▲/▼ buttons to select the appropriate AFS pump, AFS mode, and AFS time, then press ENTER.
AUTO FORM RESET DISABLED	This selection allows you to choose if you wish to use auto formula reset. This feature resets the formula number to 00 after the load count pump activates. In cases where automatic formula select is OFF (formulas selected manually), this feature ensures that an operator cannot wash a load with the wrong formula. When a washcycle is finished, the next formula must be manually chosen. Use the ▲/▼ buttons to choose either enable or disable, then press ENTER.
MM / DD / YYYY 02/17/2022 THURSDAY ▲▲ 07:51:05	This selection allows you to choose if you wish to set the system time and date. Press ▲ if you wish to set time and date, or press ENTER to continue without changing. Use the SCROLL and ▲/▼ buttons to set the date and time, then press ENTER.
PROG FORM NAMES PROG PUMP INFO TUBES CHANGED PROG FORMULAS COMPANY NAME LOAD SETUP SAVE SETUP	Use the ▲/▼ buttons to select the setting you wish to change then press ENTER. If you continue past the last setting shown on the display, you will advance to the next screen of settings. Press the left arrow button (◄) at any time to go back one step.
FORMULA 01 ENABLED ▲▲ “FORMULA 01 “	Use the ▲/▼ buttons to select the formula number, then press SCROLL to move the cursor to the right. Use the ▲/▼ buttons to select enable or disable status. SCROLL right to move the cursor to the bottom line, then use the ▲/▼ and SCROLL buttons again to change the individual characters of the formula name, then press ENTER. Repeat for each formula necessary.
PUMP 01 ▲▲ “PUMP-01“ $00.00 G	Use the ▲/▼ buttons to select the pump number, then press SCROLL to move the cursor to the bottom. Use the ▲/▼ and SCROLL buttons to change the pump name and cost, then press ENTER. Repeat for each pump necessary.

PROGRAMMING (CONTINUED)

TUBES CHANGED PUMP-01 ▲ MM / DD / YYYY HOURS 00/00/2000 00	Use the ▲/▼ buttons to select the pump number, then press SCROLL to move the cursor to the bottom. Use the ▲/▼ and SCROLL buttons to enter the date the tube was changed and how many hours until showing a notification, then press ENTER. Repeat for each pump necessary.
FORM 01 L1 PUMP 01 ▲▲ 000.0 OZS DT = 00	Use SCROLL and ▲/▼ to choose the desired formula/level/pump on the top line, then press SCROLL to move the cursor to the bottom line. Use SCROLL and ▲/▼ to set the pump volume and delay time (DT) if required then press ENTER. Repeat these steps for all pumps and formulas that will be used.
FORM 01 L1 PUMP 01 ▲▲ DRAIN COUNT = 00	This selection allows you to enter the drain assignment for each pump and formula. Use the SCROLL and ▲/▼ buttons to choose formula, level, and pump number on the top line, then press SCROLL to move the cursor to the bottom line. Set the appropriate drain count and press ENTER again. Repeat these steps for each pump on in each formula that will be used.
SIGNAL 01 ▲▲ PUMPS 00 00 00	Use the ▲/▼ buttons to choose the signal number, then press SCROLL to move the cursor to the bottom line. Use SCROLL and ▲/▼ to choose which pumps will be activated by this signal, then press ENTER.
LOAD SETUP ENTER = YES	Before inserting your USB drive to program the system make sure it contains your setup file, and that the setup file has the same system I.D. as the unit you are about to program or the file will not load properly. Next, insert your USB drive and press ENTER.
USB ERROR NO FILE OPLF-00.SET	This message will appear if the USB drive does not contain a setup file that matches the system. Press any key to continue.
SAVE SETUP?? ENTER = YES	Press ENTER if you want to save setup information to the USB drive.
SETUP SAVED	This confirmation message will appear when all of the setup information has been saved on the USB drive.

PROGRAMMING (CONTINUED)

LOGO LOAD DEFAULTS	Use the ▲/▼ buttons to select the setting you wish to change then press ENTER. If you continue past the last setting shown on the display, you will advance to the next screen of settings. Press the left arrow button (◄) at any time to go back one step.

LOAD LOGO ENTER = YES ▼ = DELETE LOGO	Before inserting your USB drive to program the system make sure it contains your logo file (see page 15 for details). Next, insert your USB drive and press ENTER. If you already have a logo file loaded on your system and you wish to delete it, press the ▼ button.

LOGO NOT FOUND	This message will appear if the USB drive does not contain a logo file. Press any key to continue.

LOAD DEFAULTS ENTER = YES	This selection allows you to clear pump volumes, flow rates and formula names in the dispenser and will reset the system to the factory default setting. Press ▲ if you wish to clear the memory and load defaults, or press ENTER to continue without loading.

MENU MAP

LANGUAGE SAVE REPORT PRIME PUMPS CLEAR RPT DATA CLEAR LOAD COUNT UNIT OF MEASURE CALIBRATE PUMP
DISPENSER ID ACCESS CODE LOCKOUT TIME DELAY UNITS OPERATING MODE PUMP LEVELS LOAD COUNT PUMP
FLUSH MODE SIGNAL TIME WASHER WEIGHT SHIFT TIMES AFS AUTO FORM RESET SET TIME/DATE
PROG FORM NAMES PROG PUMP INFO TUBES CHANGED PROG FORMULAS COMPANY NAME LOAD SETUP SAVE SETUP
LOGO LOAD DEFAULTS

ERROR SCREENS

FLUSH ERROR	This error will occur if the flow switch on the flush manifold breaks contact for longer than the error time. Check the water flow through the manifold to ensure there are no obstructions. Press the left arrow button (◄) to reset.
SIB ERROR	This error will occur if the SIB loses communication with the main controller. Check to ensure that the SIB cable is plugged in properly and that the cable is not damaged. The error will reset when communication with SIB is restored.
I / O COMM ERROR	This error will occur if the I/O circuit board (inside the main housing) loses communication with the main controller. Check to ensure that the controller cable is plugged in properly and that the cable is not damaged. The error will reset when communication with I/O circuit board is restored.
LOW LEVEL	This error will occur if a low chemical supply has been detected if using the optional low level sensors. The error will reset when low chemical level condition has been resolved.
USB ERROR	This error will occur if the USB drive does not contain a proper file for the function attempted, such as loading a setup or logo. Check the USB drive using the Flex OPL app to ensure it contains the proper files for the dispenser.

SYSTEM LED INDICATORS

- Communication LED on controller and I/O board (amber)
  The amber communication LED's will blink when there is normal communication between the controller and the I/O board.

- Power LED on controller and I/O board (green)
  The green power LED's will be on solid when there is correct power to the controller and the I/O board.

- Signal LED's on SIB (red)
  The red signal LED's on the SIB will flash sequentially in a row when the SIB is idle and there are no signals present from the washer. When the washer sends a signal (or multiple signals) the flashing will stop and the LED's for the activated signals with be on solid. When the signals are de-activated, the sequential flashing will resume.

FLEX OPL SOFTWARE APP

The Flex OPL software app allows you to use your computer to program setup files for your dispensers and also has functions to generate reports for tracking chemical usage. While the dispenser has the capability to be programmed from its keypad, programming via computer is a faster and easier way to get the dispenser setup for operation.

Installation

(1) Insert a USB flash drive into USB port on your desktop or laptop pc.

(2) Locate the file named “OP.MSI”.

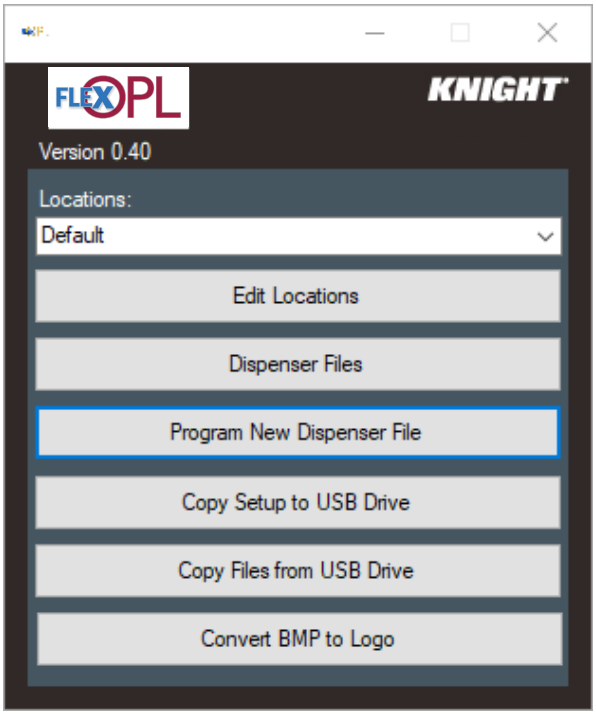
(3) Double click the OP.MSI file and follow the install program prompts.

Running the software

(1) Following successful installation of the PC software locate the Flex OPL desktop icon and double click to open the program.

(2) The start screen below will appear after a few seconds.

(3) You can now click any of the buttons on the start screen to begin the function you wish to perform.



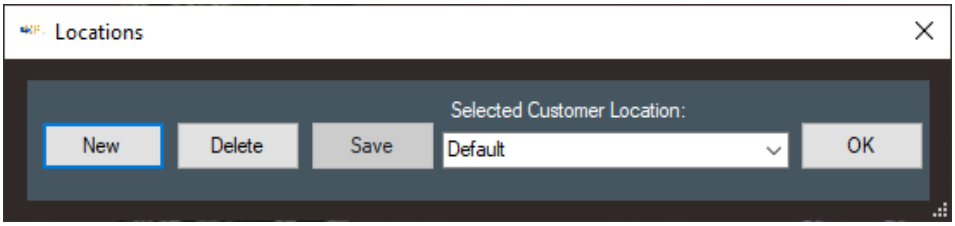
Button function definitions

- Edit locations — create, change, or delete specific customer locations.
- Dispenser files — allows you to view and manage setup files, report files, and Excel workbook files.
- Program new dispenser file — this is the function to use for creating a new “setup” file for any dispenser.
- Copy setup to USB drive — click this button to copy setup files onto a USB flash drive for loading into a dispenser.
- Copy files from USB drive—click this button to copy report files that have been saved onto a USB flash drive from a dispenser.
- Convert BMP to Logo—click this button to convert a BMP file to a logo that can be uploaded into the Flex OPL handset and shown in the display window when the system is idle.

LOCATIONS

Each installation should be setup with a specific customer location to organize dispenser files and reports more effectively. A new location setting creates its own file folder on your computer by allowing you to enter a descriptive name for the location.

Multiple dispenser locations can be setup and saved based on user preference. For laptop users, setup files can be selected from the Locations box when going from one account to another. Changing locations will change the number and type of files that are unique to each location.



Creating a new location

(1) From the main programming screen, click on Edit Locations and you will see the screen above.

(2) Click New, then type the name you wish to give the account and click OK.

(3) When finished, click Save to store the new location.

Changing locations

(1) From the screen shown above, click the down arrow from the Selected Customer Location and choose the location you want from the drop-down menu.

(2) After you have selected the customer location you want, then click OK.

Deleting a location

(1) Click on the desired choice from the Selected Customer Location, then click delete.

(2) Click OK and the Customer Location you chose will be deleted from the list.

CONVERTING A BMP FILE TO A LOGO

(1) Insert a flash drive on your computer that has the logo of your choice (logo file must be BMP format with a size of 128 x 64 pixels and in monochrome format).

(2) From the main programming screen, click on Convert BMP to Logo and you will see the screen to the right.

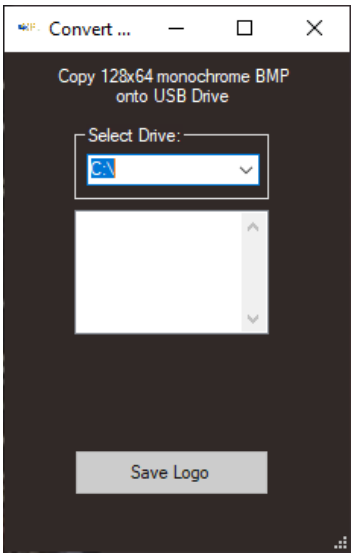
(3) Click on Select Drive and choose the location of your USB flash drive.

(4) Click on the logo file name in the rectangular window, then click Save Logo.

(5) A box will popup to confirm the logo file has been saved. Click OK.

(6) The USB drive is now ready to upload the logo file into the dispenser.

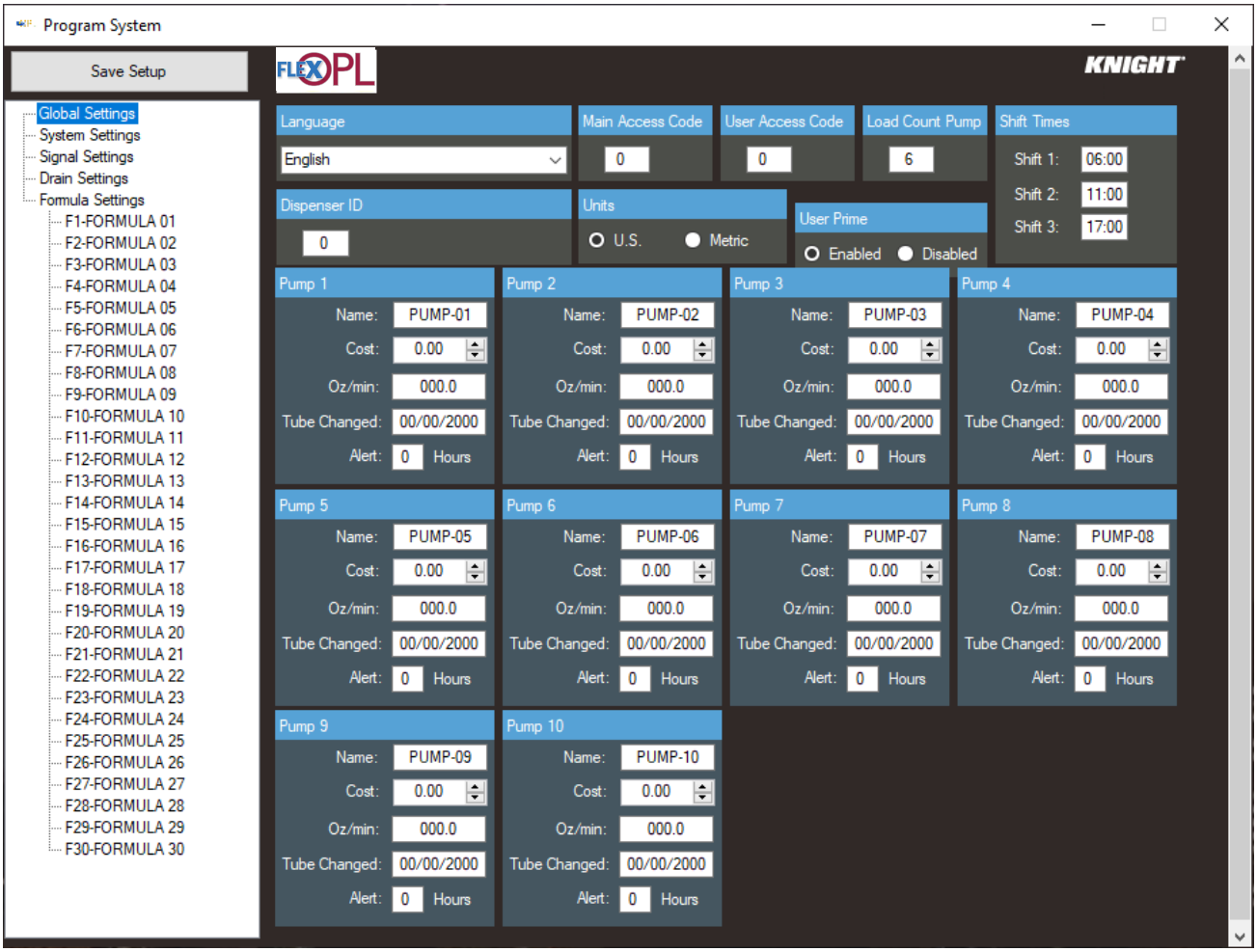
NOTE: Setup files and logo files can coexist on the flash drive and can be loaded into one dispenser or multiple dispensers depending on your choice.



PROGRAMMING A SETUP FILE

This is the view you will see when you click the Create Program File button. Before you start entering the data you will want to compile a complete list of all of the formulas and chemicals that will be used.

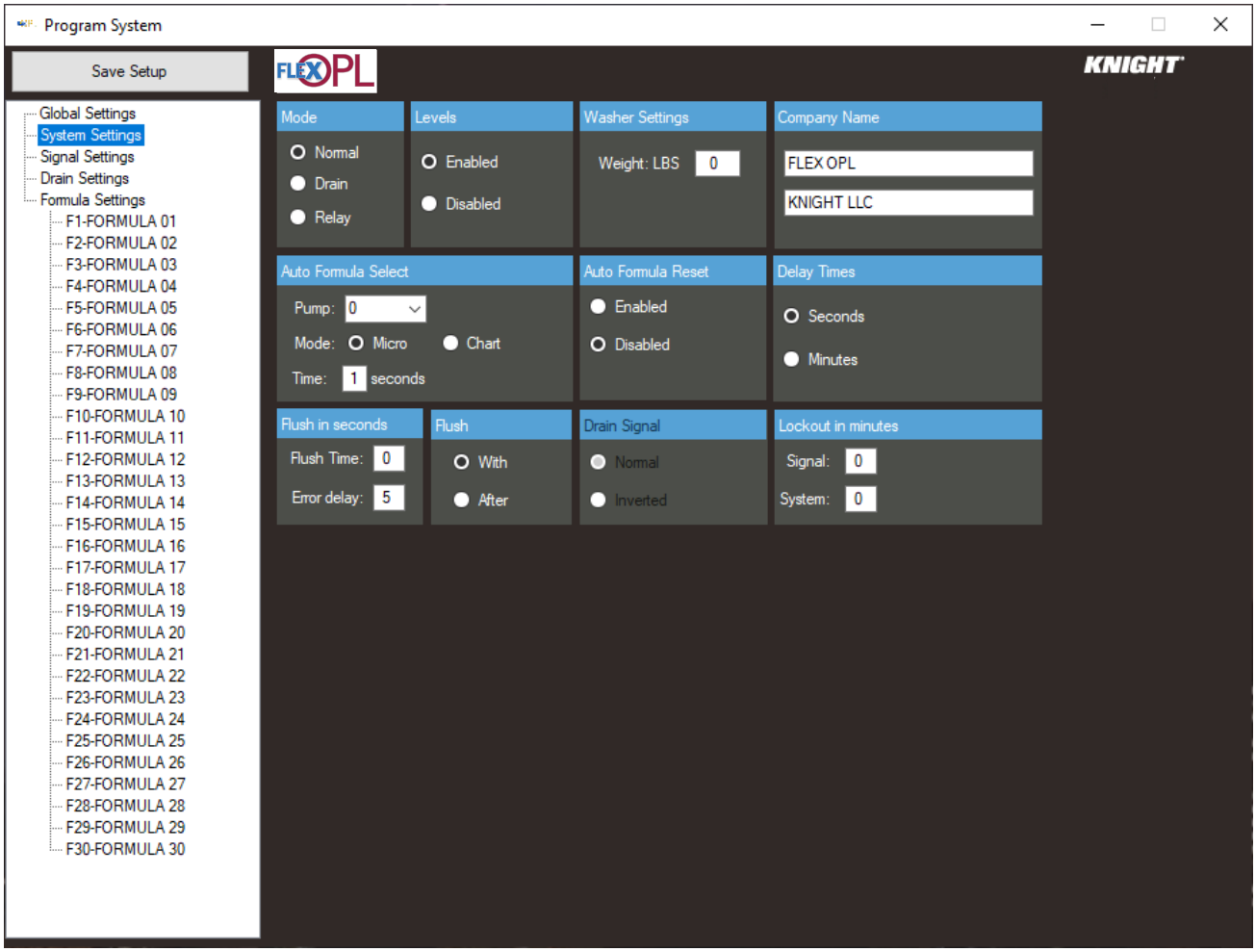
Global Settings



This screen allows you to input or change the following settings:

- Language:
- Units:
- Dispenser ID:
- Main Access Code:
- User Access Code:
- User Prime:
- Shift Times:
- Load Count Pump:
- Pump Settings:

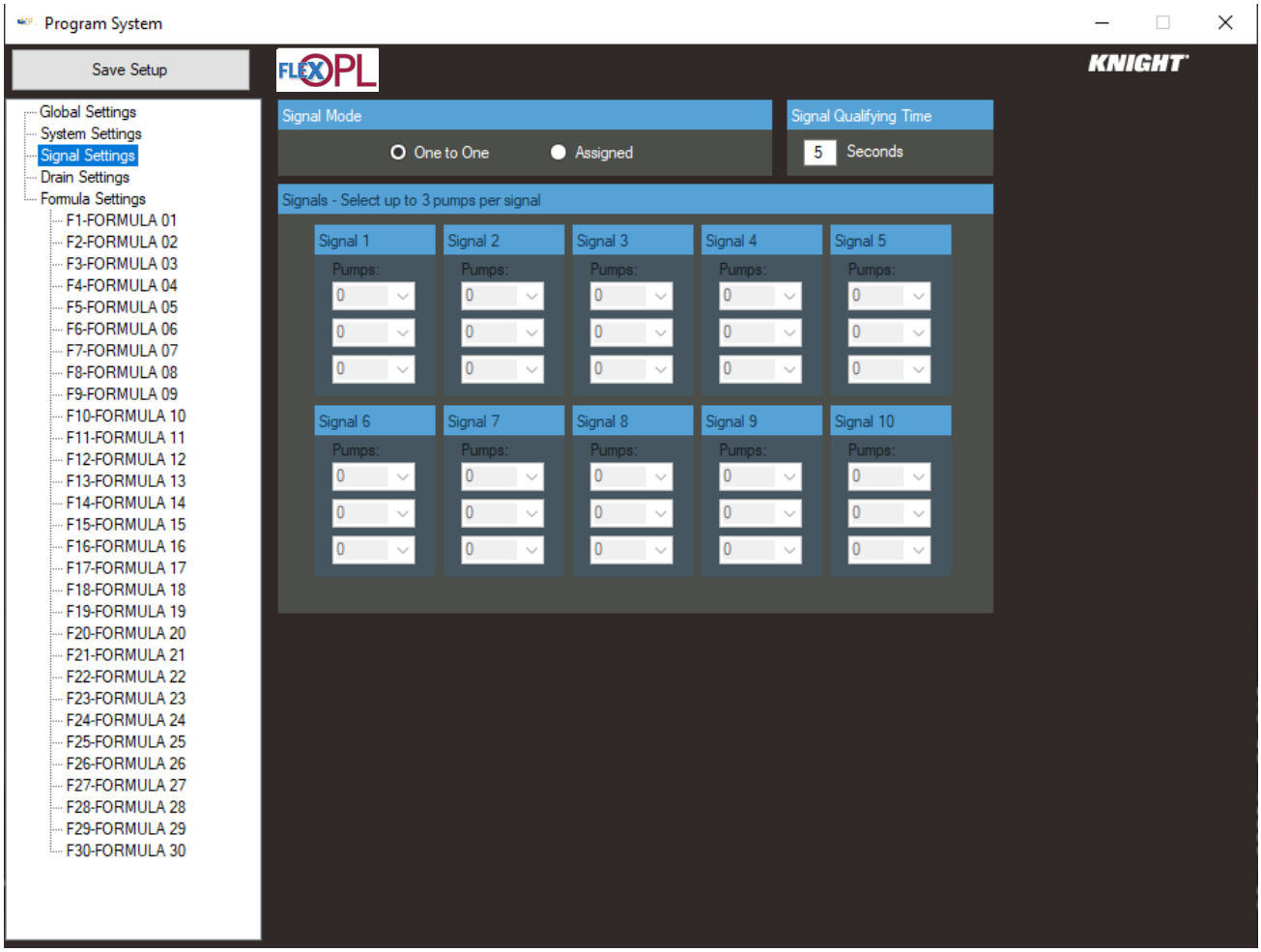
System Settings



This screen allows you to input or change the following settings:

- Mode:
- Washer Settings:
- Delay Time Units:
- Levels:
- Auto Formula Select:
- Lockout Time:
- Auto Formula Reset:
- Drain Signal:
- Flush Settings:

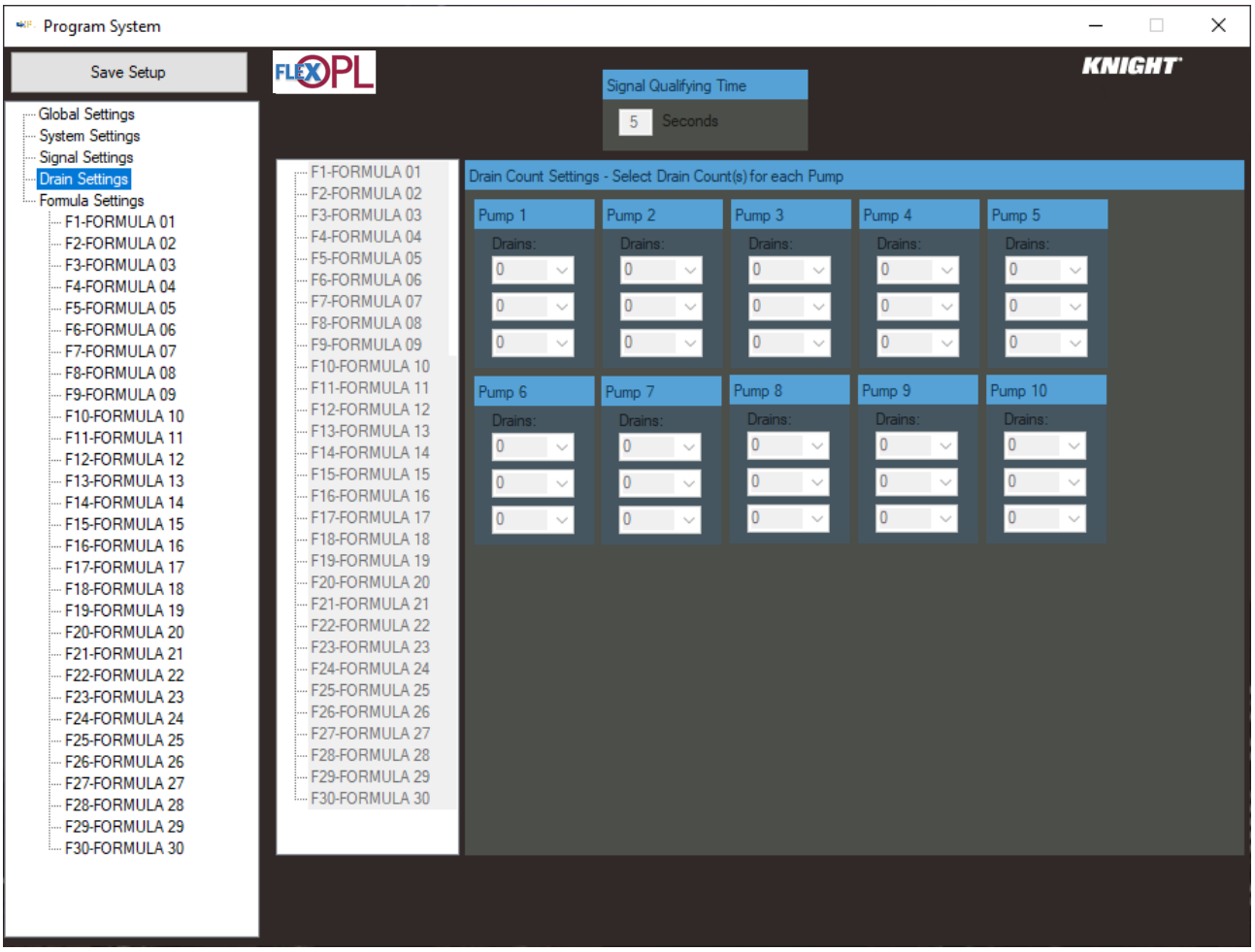
Signal Settings



This screen allows you to input or change the following settings:

- Signal Mode:
- Signal Qualifying Time:
- Signal Pump Assignments:

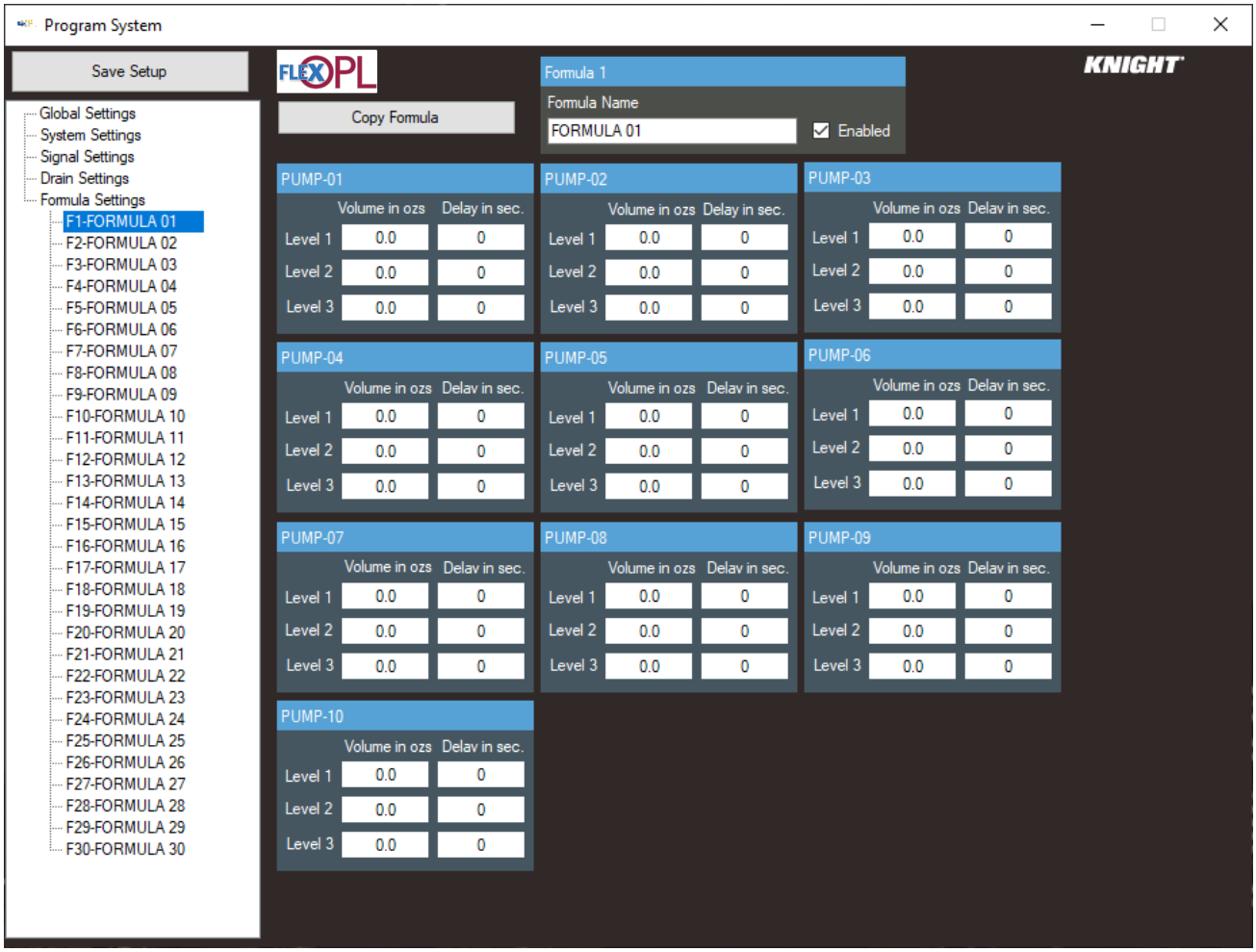
Drain Settings



This screen allows you to input or change the following settings:

- Signal Qualifying Time
- Set Drain Counts

Formula Settings

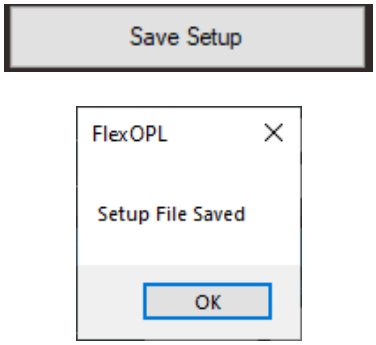


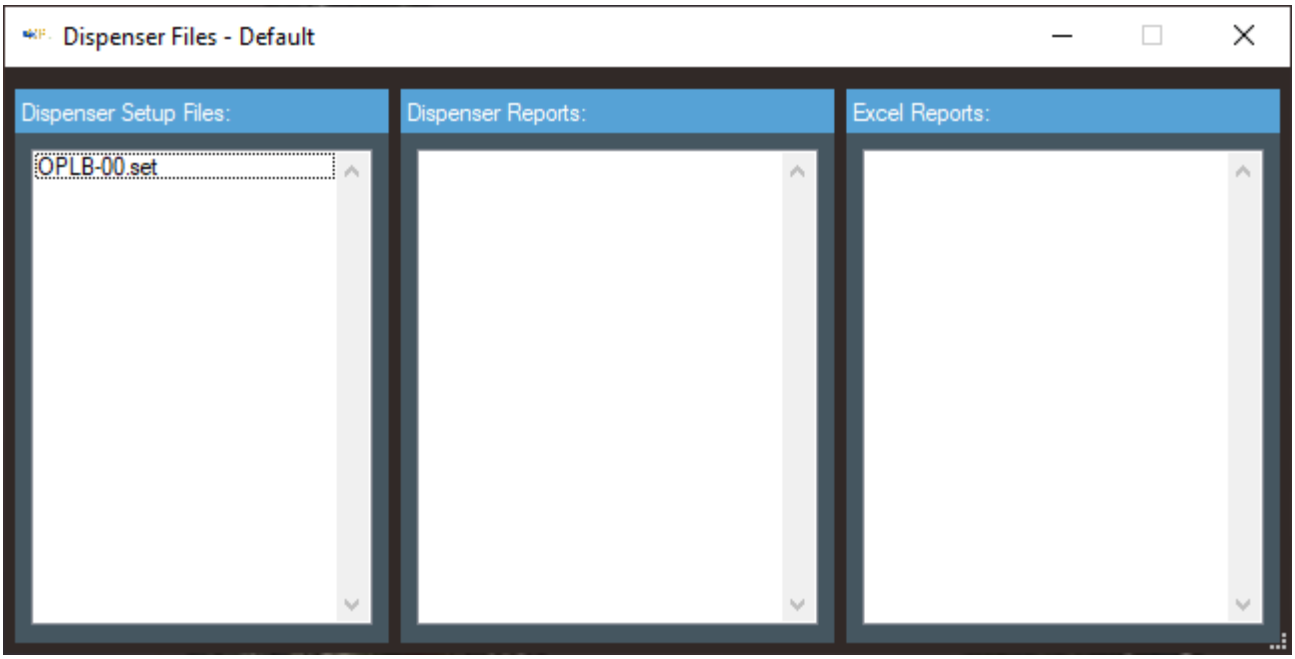
This screen allows you to input or change the following settings:

- Formula Name:
- Formula Enable:
- Pump Volumes & Delay Times:
- Copy Formula Function:

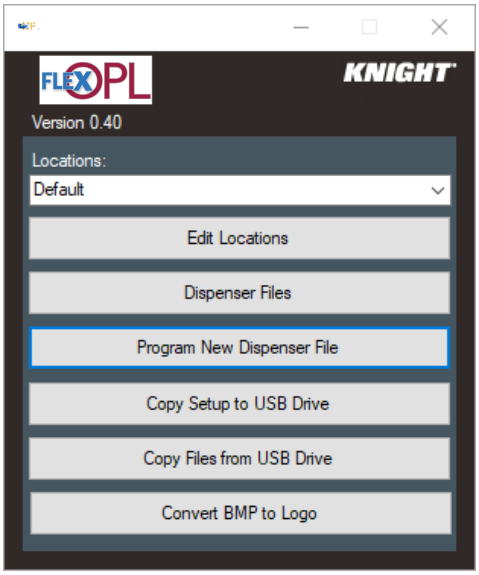
Saving Setup Data

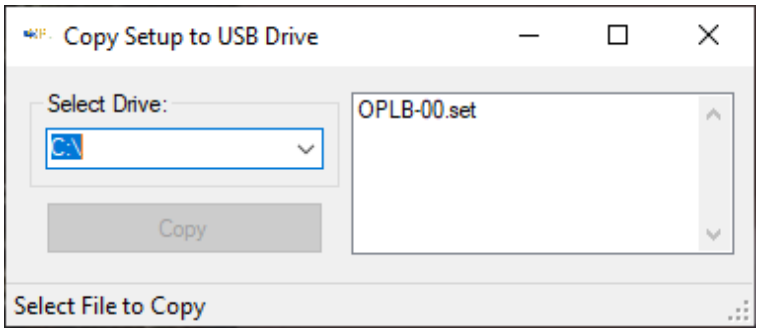
After all fields have been programmed and all data appears correct click on the Save Setup button. The setup file will now appear in the Dispenser Files view where it can be selected then uploaded to the system to start operation.





Setup Files are saved in a .set format. The system will use the dispenser ID number to name the setup file followed by the suffix. “set” at the end of the name**.** To upload a setup file to an Flex OPL dispenser go to the opening screen view and select “Copy Setup to a USB Drive”**.** Highlight the file to be saved to the USB flash drive, place it in the USB port and click the Copy button. Make sure the USB flash drive flashes for second or two while it saves then you are ready to remove the drive from your pc and place it in the USB port of the Flex OPL dispenser for uploading.



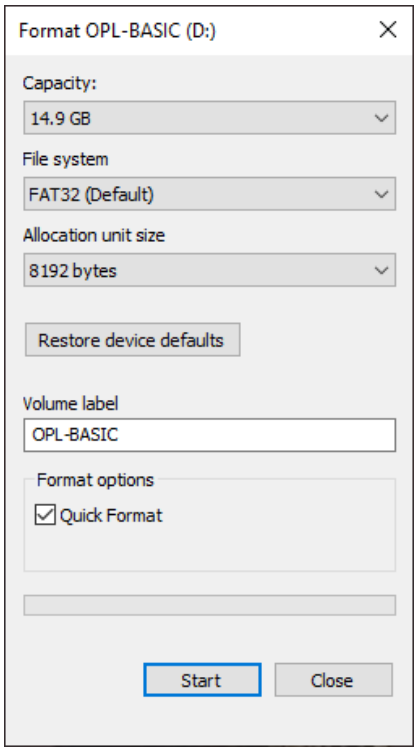


Select the USB flash drive in the Select Drive pull-down. Select the file to copy then click on the Copy button. Repeat for any other setup files.

After setup files have been uploaded from the USB drive access the programming menus on the system and check that your settings have transferred properly. Once the settings are in place proceed to calibrating the pumps before starting operation.

Downloading/Viewing Reports

Check that the USB drive you will use is properly formatted for use with this system. If the drive is not properly formatted you cannot save report files from the system or properly upload settings. The following procedure will help you do that:



Load drive into pc USB port

a. Go to My Computer
b. Right click USB drive
c. Check File System setting for FAT32
d. If it's FAT (default) click down arrow and select FAT32
e. Click Start to reformat
f. Remove USB flash drive
g. Ready for use

DOWNLOADING REPORTS FOR VIEWING / MANAGING

(1) Follow the procedures in this manual for instructions on downloading reports to a USB drive.

(2) Insert the USB flash drive with the reports file in the USB port of your PC.

(3) Go to opening screen and select the Copy Files from USB Drive button.

(4) Select the USB flash drive using the select drive pull-down.

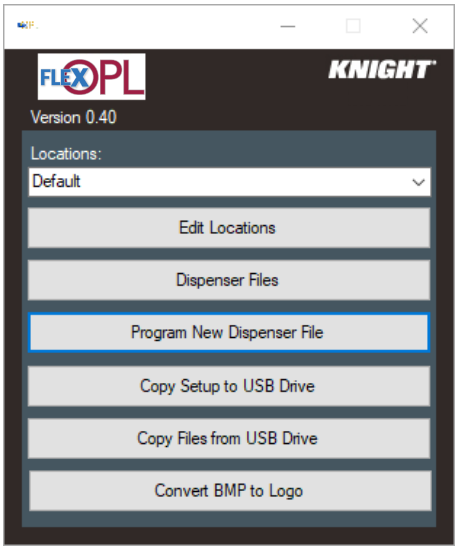
(5) Report files have the date/time the report was created as the file name with the suffix “rpt”.

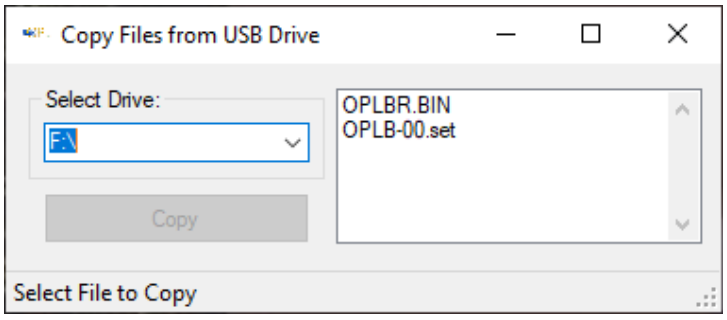
(6) Highlight the report name desired and click Copy.

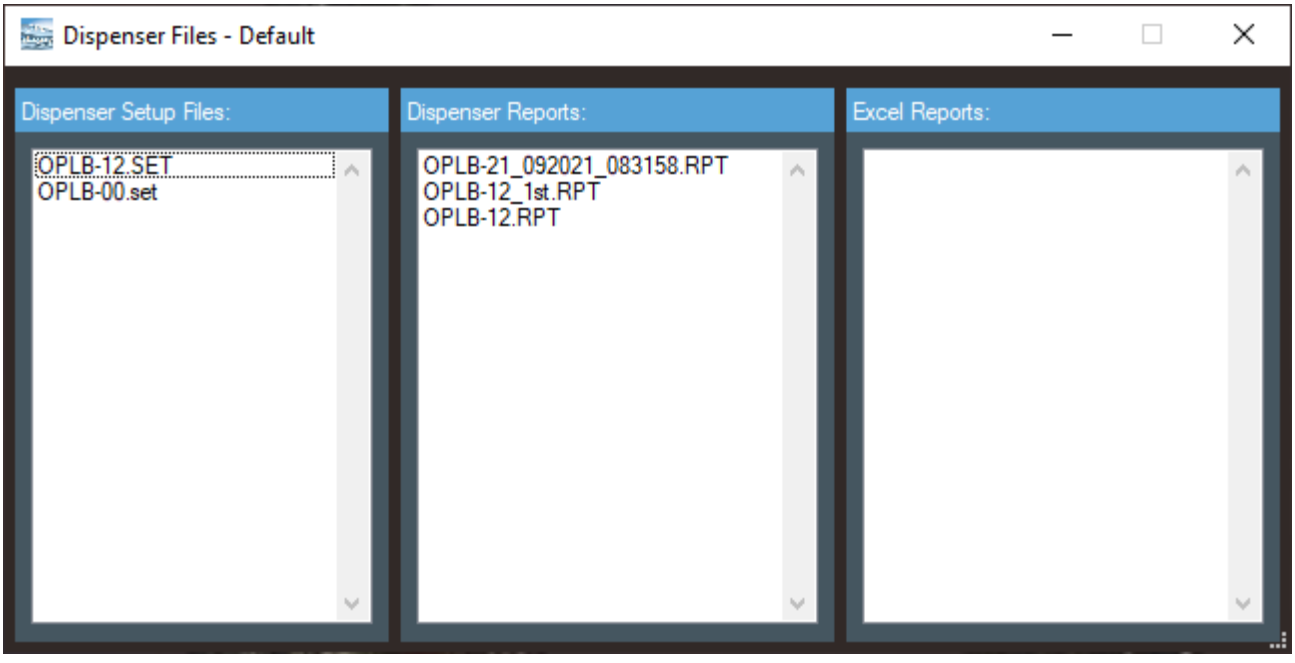
(7) Close the Copy Files from USB Drive view.

(8) The report is now available for viewing under the Dispenser Files view (below).

(9) Locate the desired report file in the Dispenser Reports directory then double click to open the report for viewing.







Setup Report

The complete setup report contains the entire settings record for operation of the system

Save to Excel File

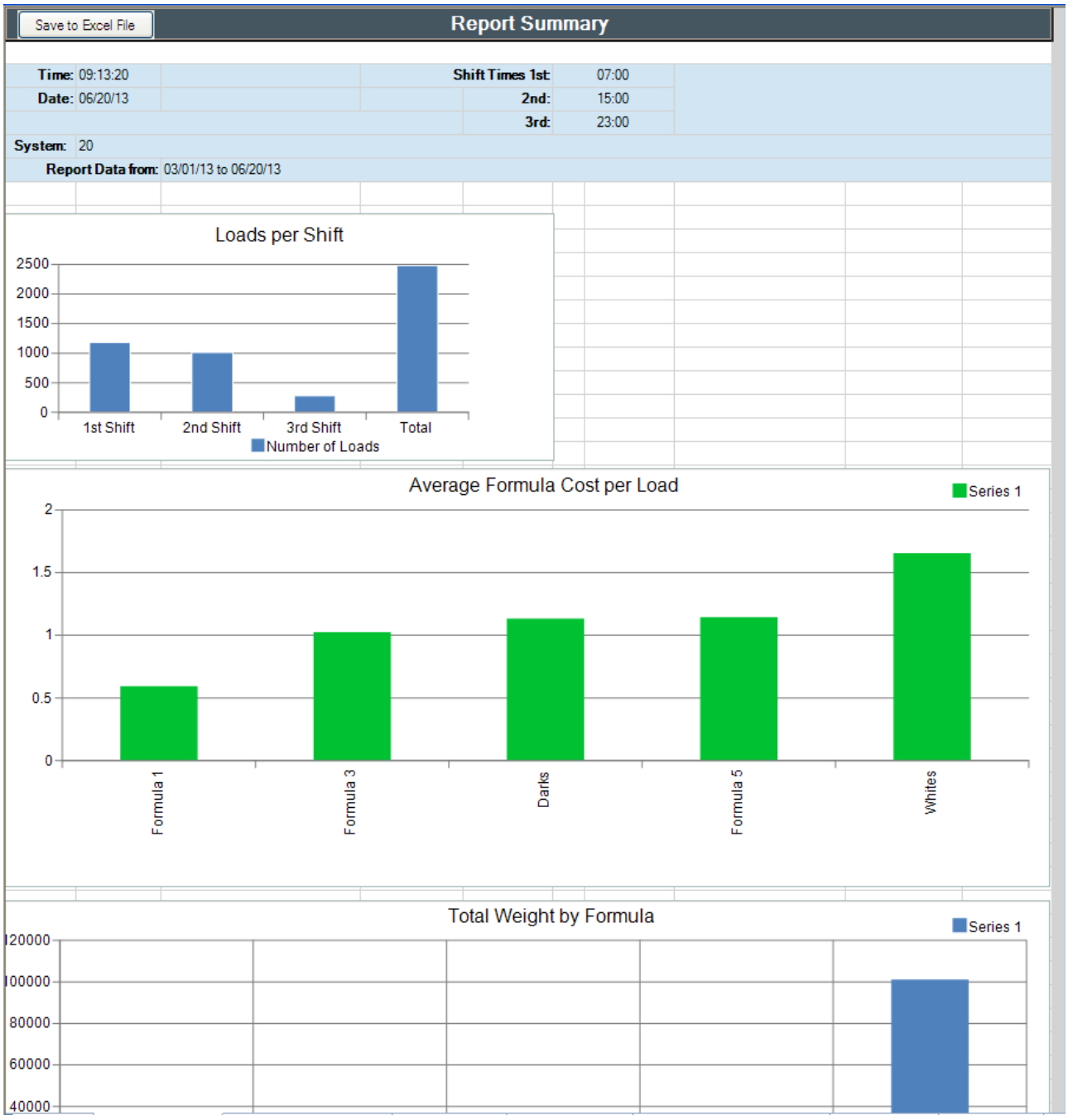
Formula Volume Settings (OZS)

Time:	09:13:20		**Shift Times 1st:**	07:00	
Date:	06/20/13		**2nd:**	15:00	
			3rd:	23:00	
System:	20				
	Report Data from:	03/01/13 to 06/20/13			

#	Formula Name	Washer1 Formula #	Washer2 Formula #	Washer3 Formula #	Washer4 Formula #	Level	Detergent		Alkali		Destainer		SourSoft	
							Volume	Delay	Volume	Delay	Volume	Delay	Volume	Delay
3	Formula 3	3	3	3	3	1	4.5	0	2.5	0	0.0	0	1.5	0
						2	0.0	0	0.0	0	0.0	0	0.0	0
						3	0.0	0	0.0	0	0.0	0	0.0	0
						4	0.0	0	0.0	0	0.0	0	0.0	0
4	Darks	4	4	4	4	1	4.5	0	2.5	0	0.0	0	1.5	0
						2	0.0	0	0.0	0	0.0	0	0.0	0
						3	0.0	0	0.0	0	0.0	0	0.0	0
						4	0.0	0	0.0	0	0.0	0	0.0	0
5	Formula 5	5	5	5	5	1	6.0	0	3.0	0	4.0	0	1.5	0
						2	0.0	0	0.0	0	0.0	0	0.0	0
						3	0.0	0	0.0	0	0.0	0	0.0	0
						4	0.0	0	0.0	0	0.0	0	0.0	0
6	Whites	6	6	6	6	1	6.0	0	3.0	0	4.0	0	1.5	0
						2	0.0	0	0.0	0	0.0	0	0.0	0
						3	0.0	0	0.0	0	0.0	0	0.0	0
						4	0.0	0	0.0	0	0.0	0	0.0	0

Summary Reports

This report provides “easy to consume” data on wash cycles run, chemical usage and washer productivity.



Cycle report

This is the most important report in terms of managing chemical usage, cleaning quality, and operation of the dispensers.

Save to Excel File

Wash Cycle Tracking (Ozs)

Time: 09:13:20 **Shift Times 1st:** 07:00
Date: 06/20/13 **2nd:** 15:00
3rd: 23:00
System: 20
Report Data from: 03/01/13 to 06/20/13

Start Date	Start Time	End Date	End Time	System ID	Washer ID	Formula	Cycle Time	Load Weight	Detergent	Alkali	Destainer	SourSoft
03/01/13	02:25:16	03/01/13	02:47:35	10	4	4	00:22:19	60 Lbs	4.5	2.5	0.0	1.5
03/01/13	03:49:23	03/01/13	03:49:29	10	2	4	00:00:06	60 Lbs	0.0	0.0	0.0	1.5
03/01/13	04:01:10	03/01/13	04:01:16	10	1	6	00:00:06	60 Lbs	0.0	0.0	0.0	1.5
03/01/13	06:240:14	03/01/13	07:14:37	10	1	6	00:30:22	60 Lbs	6.0	3.0	4.0	1.5
03/01/13	06:243:231	03/01/13	07:16:11	10	2	6	00:30:24	60 Lbs	6.0	3.0	4.0	1.5
03/01/13	07:250:26	03/01/13	08:24:47	10	1	6	00:30:20	60 Lbs	6.0	3.0	4.0	1.5
03/01/13	07:252:217	03/01/13	08:25:09	10	2	6	00:30:11	60 Lbs	6.0	3.0	4.0	1.5
03/01/13	07:254:247	03/01/13	08:27:24	10	4	6	00:30:26	60 Lbs	6.0	3.0	4.0	1.5
03/01/13	18:26:229	03/01/13	18:57:09	10	1	6	00:30:24	60 Lbs	6.0	3.0	4.0	1.5
03/01/13	18:226:17	03/01/13	19:00:45	10	2	6	00:30:28	60 Lbs	6.0	3.0	4.0	1.5
03/01/13	18:228:248	03/01/13	19:01:24	10	4	5	00:30:28	60 Lbs	4.5	2.5	0.0	1.5
03/01/13	19:29:17	03/01/13	19:59:43	10	1	6	00:30:26	60 Lbs	6.0	3.0	4.0	1.5
03/01/13	19:230:32	03/01/13	20:04:58	10	2	6	00:30:26	60 Lbs	6.0	3.0	4.0	1.5
03/01/13	19:232:24	03/01/13	20:06:54	10	4	6	00:30:30	60 Lbs	6.0	3.0	4.0	1.5
03/01/13	20:235:19	03/01/13	21:09:47	10	2	5	00:30:28	60 Lbs	4.5	2.5	0.0	1.5
03/01/13	20:244:10	03/01/13	21:18:37	10	4	6	00:30:27	60 Lbs	6.0	3.0	4.0	1.5
03/01/13	20:247:07	03/01/13	21:21:28	10	1	5	00:30:21	60 Lbs	4.5	2.5	0.0	1.5
03/01/13	233:238:234	03/02/13	00:19:13	10	1	4	00:22:25	60 Lbs	4.5	2.5	0.0	1.5
03/02/13	00:02:237	03/02/13	00:33:09	10	4	6	00:30:31	60 Lbs	6.0	3.0	4.0	1.5
03/02/13	00:07:245	03/02/13	00:38:20	10	2	6	00:30:28	60 Lbs	6.0	3.0	4.0	1.5
03/02/13	01:29:05	03/02/13	01:59:36	10	2	5	00:30:30	60 Lbs	4.5	2.5	0.0	1.5
03/02/13	01:228:13	03/02/13	02:02:38	10	1	6	00:30:24	60 Lbs	6.0	3.0	4.0	1.5
03/02/13	03:28:05	03/02/13	03:58:25	10	1	6	00:30:20	60 Lbs	6.0	3.0	4.0	1.5
03/02/13	04:07:30	03/02/13	04:29:56	10	2	4	00:22:26	60 Lbs	4.5	2.5	0.0	1.5
03/02/13	04:22:251	03/02/13	04:53:22	10	4	6	00:30:33	60 Lbs	6.0	3.0	4.0	1.5
03/02/13	05:10:237	03/02/13	05:41:12	10	1	6	00:30:28	60 Lbs	6.0	3.0	4.0	1.5
03/02/13	05:34:222	03/02/13	05:57:00	10	2	3	00:22:26	60 Lbs	4.5	2.5	0.0	1.5
03/02/13	05:229:08	03/02/13	06:03:36	10	4	6	00:30:28	60 Lbs	6.0	3.0	4.0	1.5
03/02/13	06:25:231	03/02/13	06:48:11	10	2	4	00:22:24	60 Lbs	4.5	2.5	0.0	1.5
03/02/13	06:28:13	03/02/13	06:51:13	10	1	4	00:22:59	60 Lbs	4.5	2.5	0.0	1.5
03/02/13	20:19:235	03/02/13	20:50:08	10	4	6	00:30:30	60 Lbs	6.0	3.0	4.0	1.5
03/02/13	20:23:21	03/02/13	20:53:49	10	2	6	00:30:28	60 Lbs	6.0	3.0	4.0	1.5
03/02/13	20:26:236	03/02/13	20:57:03	10	1	6	00:30:36	60 Lbs	6.0	3.0	4.0	1.5
03/04/13	23:13:32	03/04/13	23:13:38	10	1	4	00:00:06	60 Lbs	0.0	0.0	0.0	1.5
03/04/13	23:14:51	03/04/13	23:14:57	10	2	6	00:00:06	60 Lbs	0.0	0.0	0.0	1.5
03/04/13	23:15:48	03/04/13	23:15:54	10	4	5	00:00:06	60 Lbs	0.0	0.0	0.0	1.5
03/04/13	233:229:19	03/05/13	00:06:45	10	1	6	00:27:25	60 Lbs	8.0	3.0	8.0	1.9

Save to Excel File

Formula Volume Settings (OZS)

Time: 09:13:20 **Date:** 05/20/13

Shift Times 1st: 07:00 **2nd:** 15:00 **3rd.** 23.00

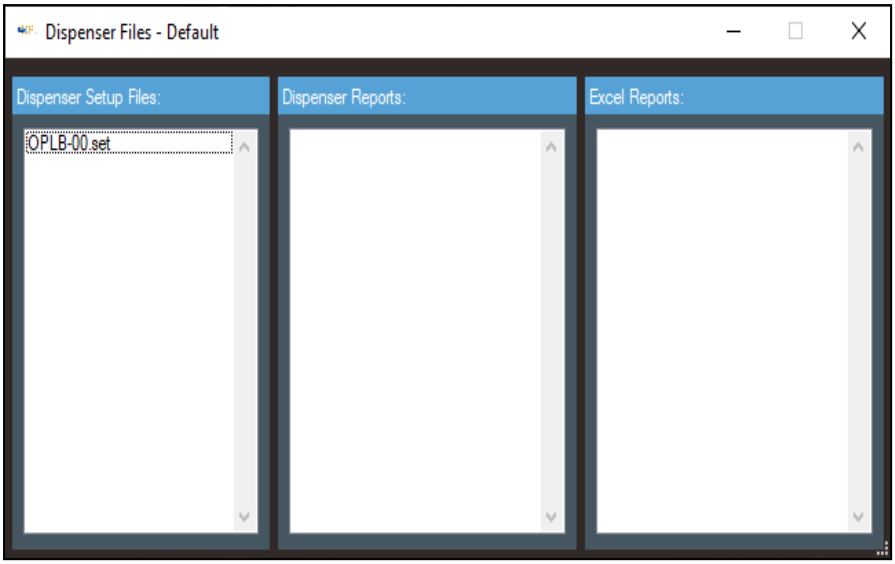
System: 20

Report Data from: 03/01/13 to 06/20/13

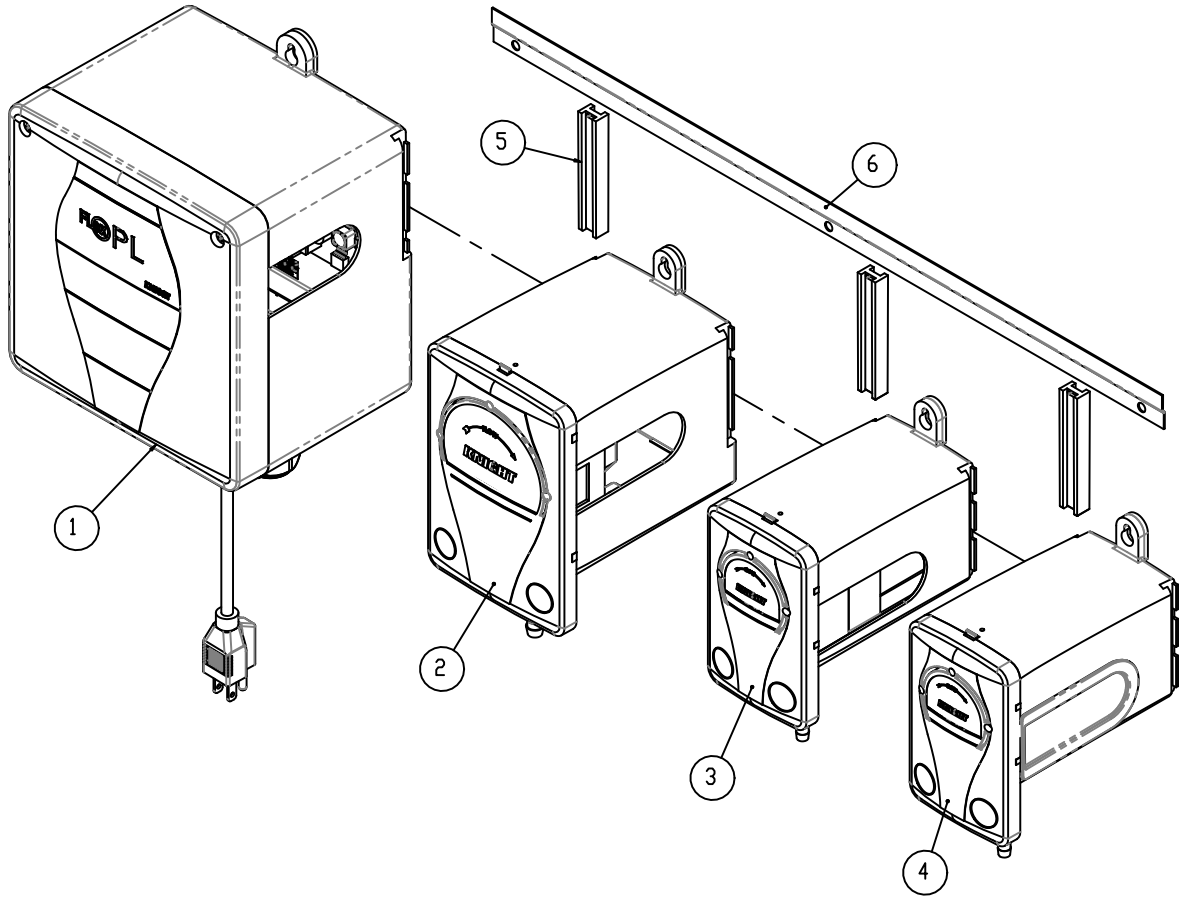
#	Formula Name	Washer1 Formula #	Washer2 Formula #	Washer3 Formula #	Washer4 Formula #	Level	Detergent		Alkali		Destainer		SourSoft	
							Volume	Delay	Volume	Delay	Volume	Delay	Volume	Delay
3	Formula 3	3	3	3	3	1	4.5	0	2.5	0	0.0	0	1.5	0
						2	0.0	0	0.0	0	0.0	0	0.0	0
						3	0.0	0	0.0	0	0.0	0	0.0	0
						4	0.0	0	0.0	0	0.0	0	0.0	0
4	Darks	4	4	4	4	1	4.5	0	2.5	0	0.0	0	1.5	0
						2	0.0	0	0.0	0	0.0	0	0.0	0
						3	0.0	0	0.0	0	0.0	0	0.0	0
						4	0.0	0	0.0	0	0.0	0	0.0	0
5	Formula 5	5	5	5	5	1	6.0	0	3.0	0	4.0	0	1.5	0
						2	0.0	0	0.0	0	0.0	0	0.0	0
						3	0.0	0	0.0	0	0.0	0	0.0	0
						4	0.0	0	0.0	0	0.0	0	0.0	0
6	Whites	6	6	6	6	1	6.0	0	3.0	0	4.0	0	1.5	0
						2	0.0	0	0.0	0	0.0	0	0.0	0
						3	0.0	0	0.0	0	0.0	0	0.0	0
						4	0.0	0	0.0	0	0.0	0	0.0	0

Exporting to Excel format

Anytime a Flex OPL report is open for viewing you can choose to save the file in an Excel format by simply clicking on the “Save to Excel File” button located in the upper left of the report viewer. The Excel version of the report appears in the System Files directory in the column marked Excel Reports. Provided you have Excel 2007 or newer you can then email these files, merge them with older records or manipulate the data in a way that suits your needs.

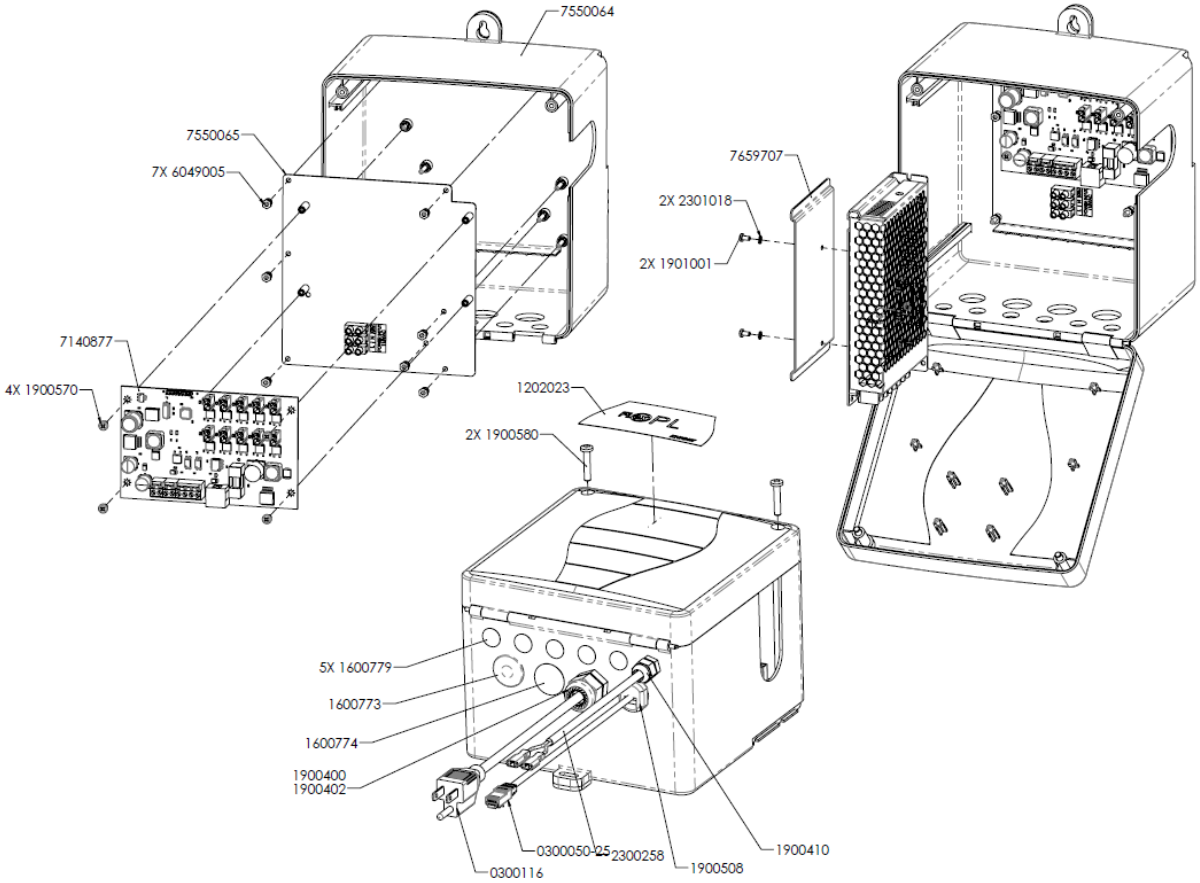


PARTS DIAGRAM—SYSTEM LAYOUT



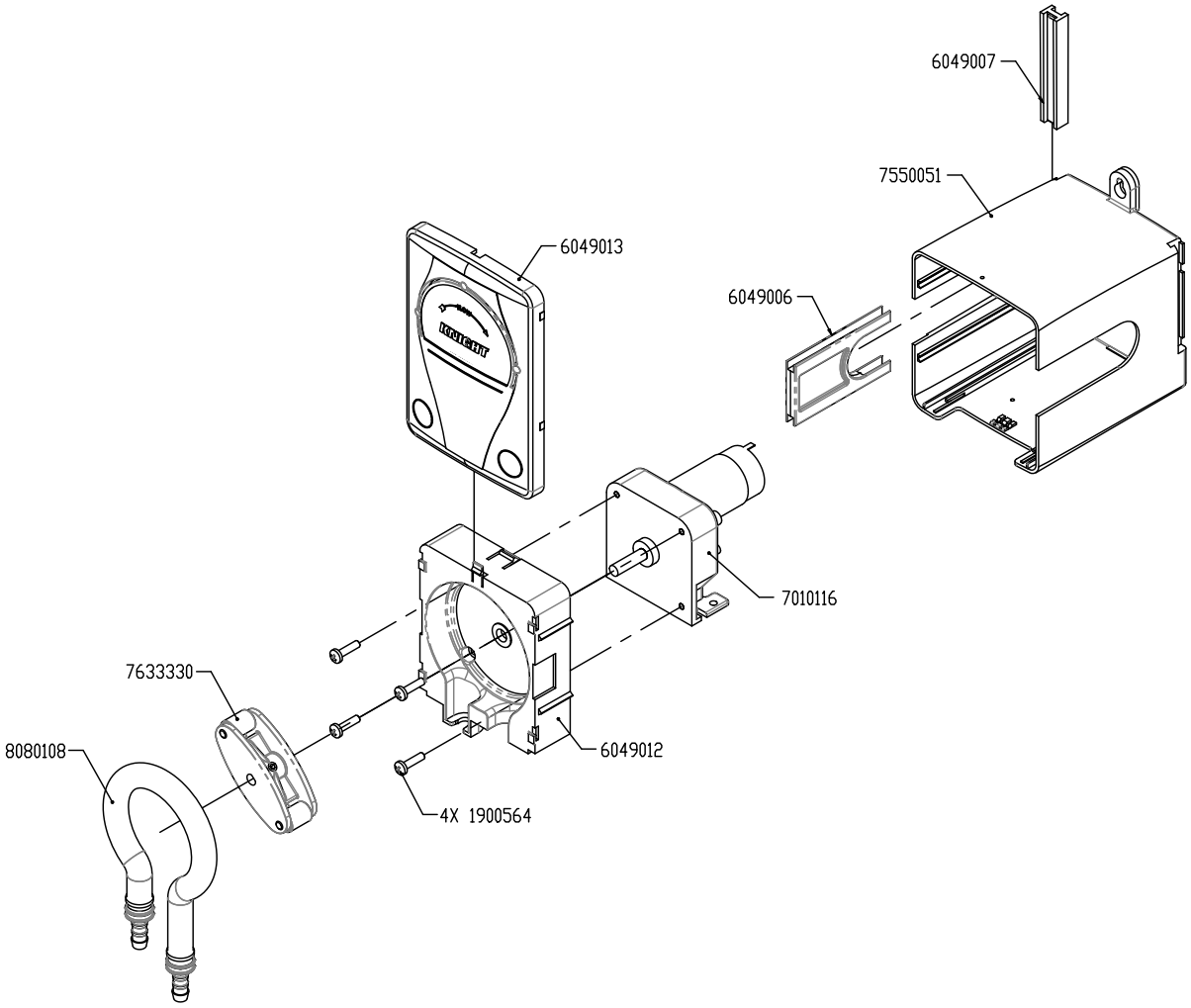
System Layout Reference		
Item	Part No	Description
1	7550000	Base, Flex OPL
2	7550015	Pump Kit, 800 Series 110 RPM
3	7550014	Pump Kit, 500 Series 200 RPM
4	7550014	Pump Kit, 500 Series 200 RPM
5	6049007	Vertical Connector
6	7550059-1	Joggle Bracket (up to 5 pumps)
	7550059-2	Joggle Bracket (up to 6 pumps)
	7550059-3	Joggle Bracket (up to 10 pumps)
Not Shown	7550020	Module, SIB Flex OPL Knight
	7550011	Module, Flex OPL Remote w/Knight Label

PARTS DIAGRAM—7550000



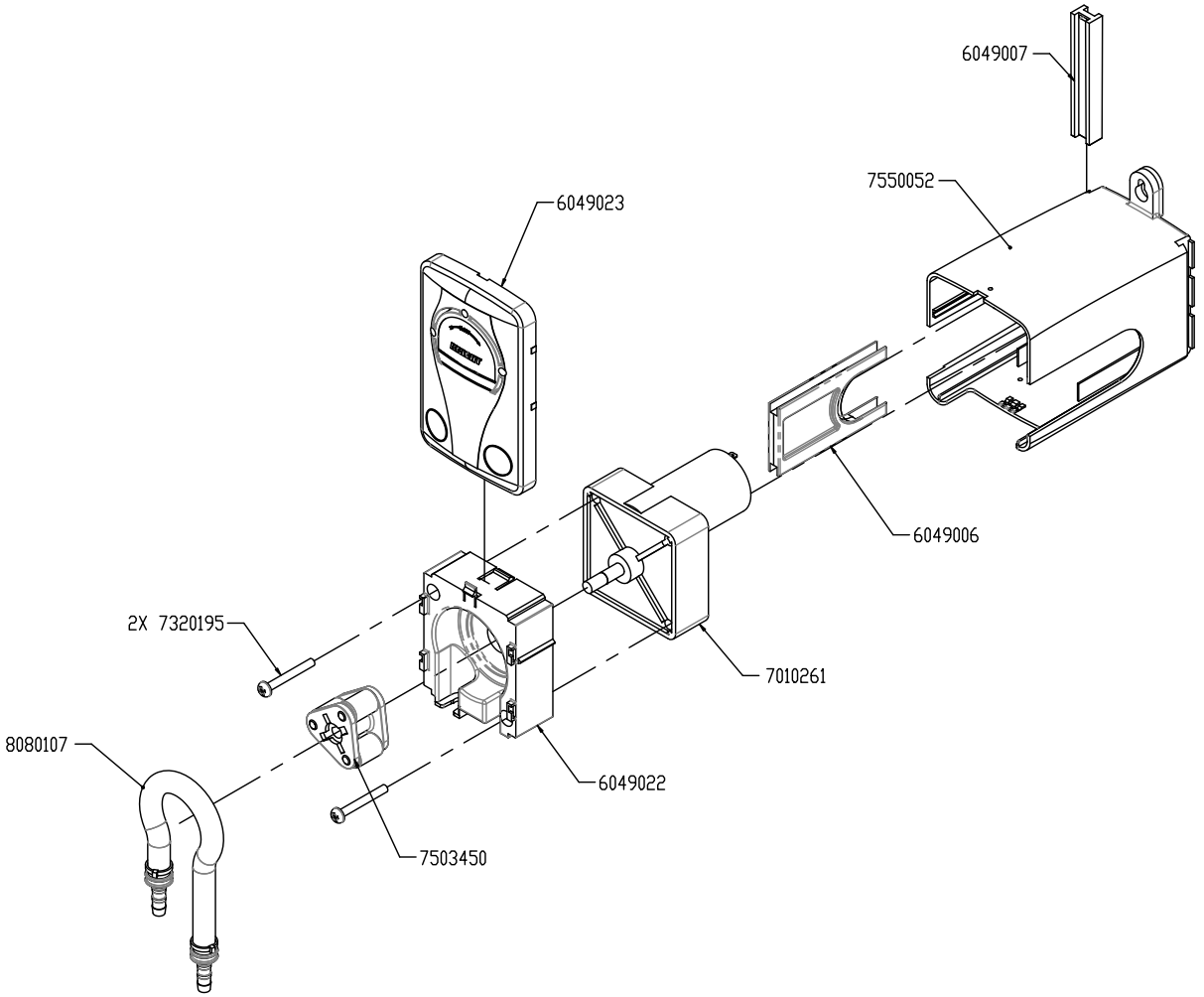
Base, Flex OPL	
Part No	Description
0300116	Power Cord, 3 Conductor Plug, 18/3 GA. SJT, Gray, 20 ft.
1600773	Hole Plug, 20mm x .13 PNL THK, Nylon, black
1600774	Plug, .875 Hole Size, Black, Nylon, .125 Panel THK
1600779	Plug, .50 Hole Size, Black, Nylon, .125 Panel THK
1900410	Strain Relief, .50 Dia Hole .114 - .250 Cable Dia.
1900570	Screw, #6-32 X 1/4, 18-8 SST, Phillips Pan Head
1900580	Screw, #10-32 X 1, 18-8 SST, Phillips Pan Head
1900660	Strain Relief Bushing MP7K2, 7/8 MTG Hole, .125 Panel THK
1901001	Screw, M3 x 0.5mm, 6mm Long, 18-8 SST, Phillips Pan Head
2300258	Wire Harness, Solenoid Valve
2000530	Power Supply, 24VDC 156W 6.5A
6049005	Hexagon Sleeve
6049026	End Wire Plug

PARTS DIAGRAM—7550015



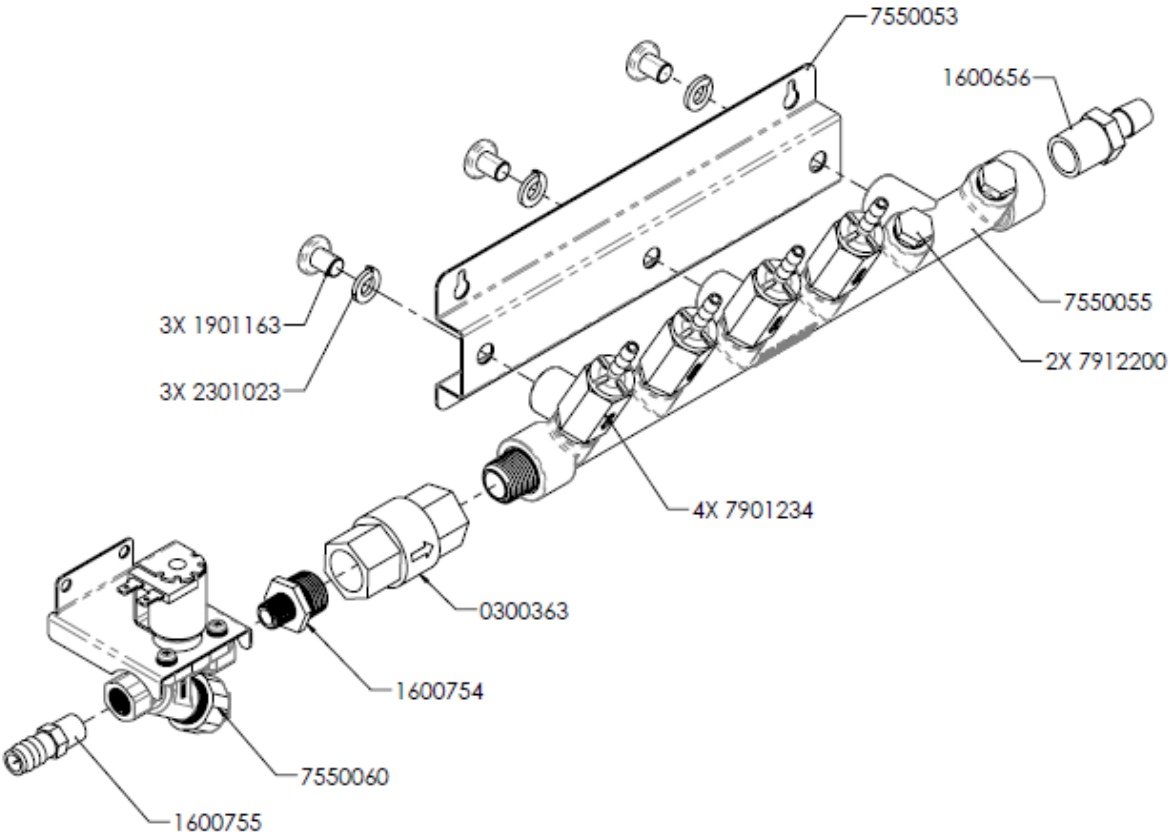
Pump Kit, 800 Series 110 RPM	
Part No	Description
1900564	Screw, #10-32 X 3/4, 18-8 SST, Phillips Pan Head
7010116	Gearmotor, 110 RPM
7633330	R-850 Roller Blk. Assy, Yellow Roller,T-50/66
6049006	Housing Connector
6049007	Vertical Connector
6049012	Pump Body, 800 Series
6049013	Face Plate, 800 Series
8080108	Tube Assy, 800 Pump
7550051	Pump Housing, 800 Series

PARTS DIAGRAM—7550014



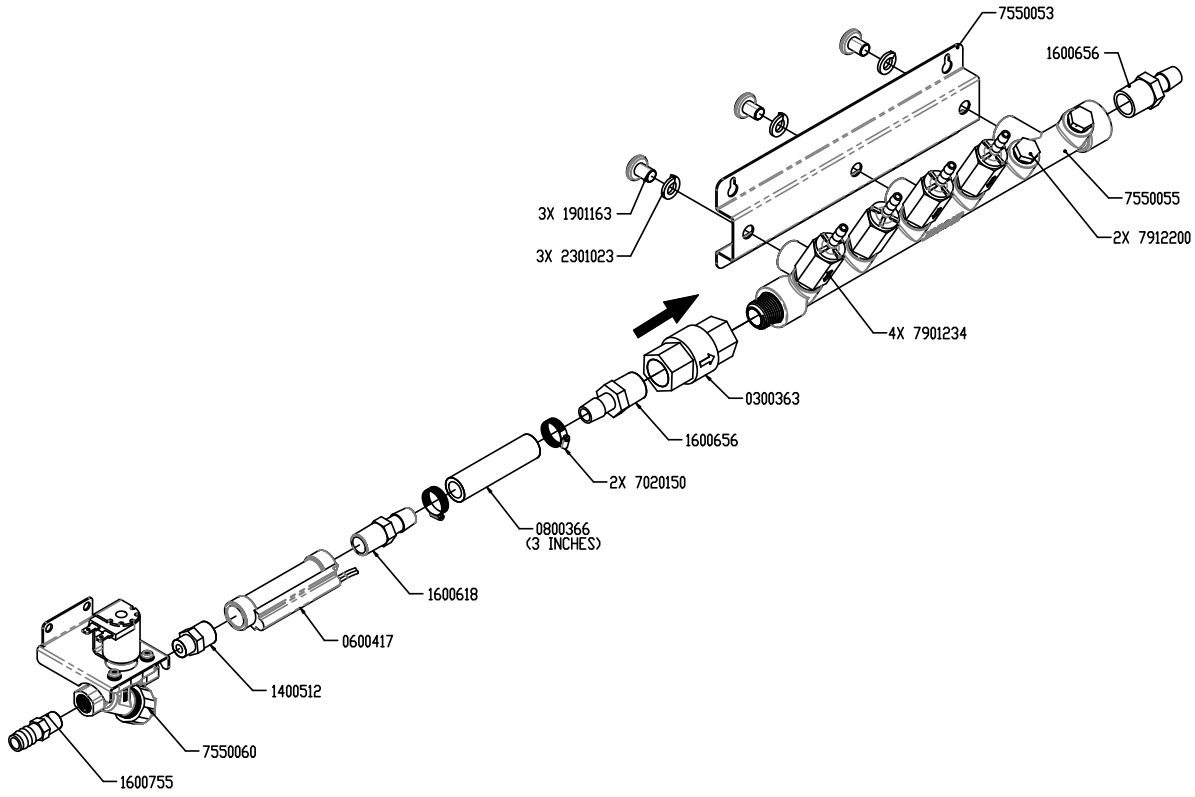
Pump Kit, 500 Series 200 RPM	
Part No	Description
6049006	Housing Connector
6049007	Vertical Connector
6049022	Pump Body, 500 Series
6049023	Face Plate, 500 Series
7010261	Gearmotor, 200 RPM
7320195	Screw, #10-32 X 1-1/2, 18-8 SST, Phillips Pan Head
7503450	3-Lobe Roller Assembly, Yellow Rollers (T-50)
7550052	Pump Housing, 500 Series
8080107	Tube Assy, 500 Pump

PARTS DIAGRAM—FLUSH MANIFOLD WITHOUT FLOW SWITCH



Flush Manifold without Flow Switch	
Part No	Description
0300363	Check Valve, 1/2 FNPT, EPDM
1600656	Fitting, Adaptor, PP, 1/2 MNPT x 1/2 Barb
1600755	Fitting, PP, 1/4 MNPT X 1/2 Barb
1901163	Screw, Pan Head, 18-8 SST, 3/8-16 x 1/2 in, Phillips
2301023	Washer, Split Lock, 3/8, 18-8 SST
1600754	Fitting, Straight Reducer, 1/2 MNPT X 1/4 MNPT, PP
7550053	Bracket, Mounting, Manifold
7550055	Manifold, 6 Port, Flex OPL
7550060	Solenoid Valve Assy, 24 VDC
7901234	Check Valve, 1/4 Barb IN x 1/4 MNPT OUT, Viton
7912200	Plug, Hex, PP, 1/4 MNPT

PARTS DIAGRAM—FLUSH MANIFOLD WITH FLOW SWITCH



Flush Manifold	
Part Nor	Description
0300363	Check Valve, 1/2 FNPT, EPDM
0600417	Flow Switch, 0.3 GPM
0800366	Hose, Braided Clear Vinyl, 1/2 ID x 3/4 OD
1400512	Fitting, Reducer Nipple, PE, 3/8 x 1/4 MNPT
1600618	Fitting, PP, 3/8 MNPT X 1/2 Barb
1600656	Fitting, Adaptor, PP, 1/2 MNPT x 1/2 Barb
1600755	Fitting, PP, 1/4 MNPT X 1/2 Barb
1901163	Screw, Pan Head, 18-8 SST, 3/8-16 x 1/2 in, Phillips
2301023	Washer, Split Lock, 3/8, 18-8 SST
7020150	Clamp, Hose, SST
7550053	Bracket, Mounting, Manifold
7550055	Manifold, 6 Port, Flex OPL
7550060	Solenoid Valve Assy, 24 VDC
7901234	Check Valve, 1/4 Barb IN x 1/4 MNPT OUT, Viton
7912200	Plug, Hex, PP, 1/4 MNPT

SQUEEZE TUBE REPLACEMENT

Remove / install pump face plate

⚠ **Removal or installation of the pump face plate for maintenance purposes should ONLY be performed by qualified and trained personnel who are considered the Responsible Body for the system.**

⚠ **The laundry facility operators of the system should NEVER attempt removal or installation of the pump face plate and should be made aware of this by the Responsible Body.**

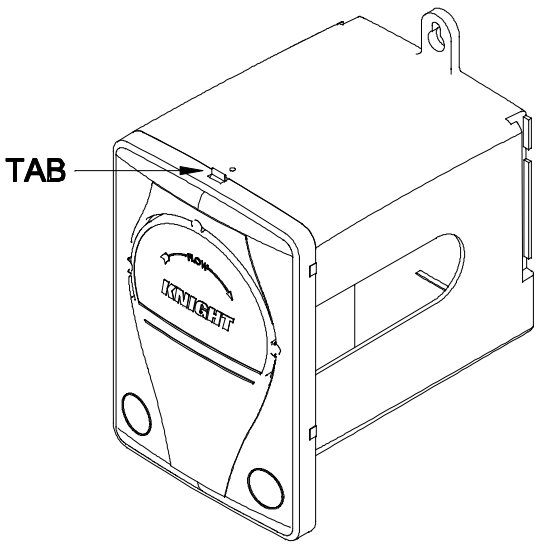
⚠ **Access to internal parts are for Responsible Body (i.e. service personnel).**

Removal

To remove the face plate, gently push back on the tab and slide the face plate up, then pull it away from the pump assembly.

Installation

Install the face plate into the slots and slide down so that the tab clicks into place.



Replacing squeeze tube

(1) Bleed any pressure from discharge line.

(2) Disconnect suction and discharge lines from tube.

(3) Remove the faceplate of the pump per steps shown above.

(4) Pull old tube out, being careful not to splash chemical. Insert new tube by squeezing into place.

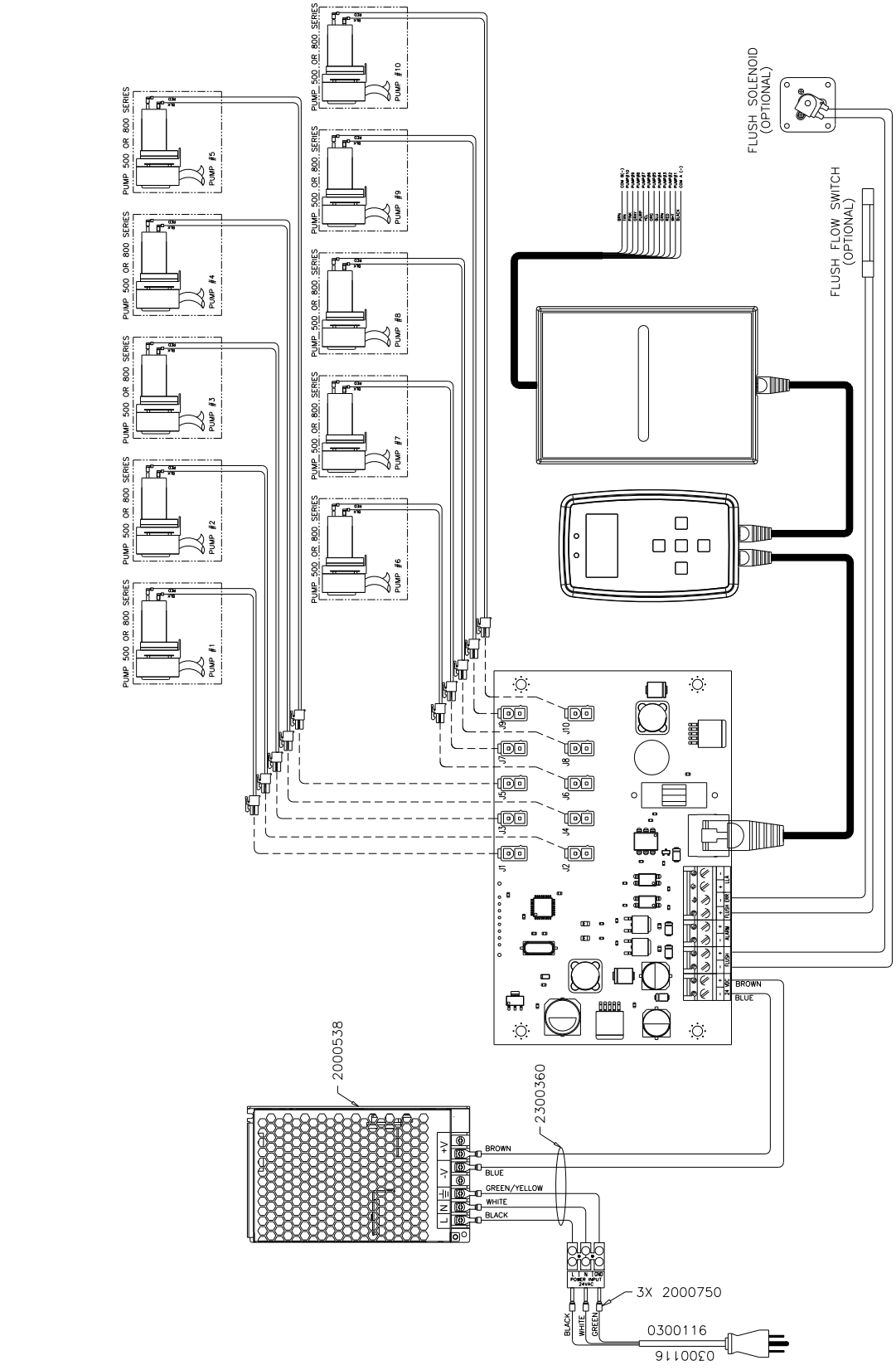
(5) Apply a small amount of silicone tube lube to the middle third of the tube where the rollers contact it.

(6) Put the faceplate back on the pump per steps shown above.

(7) Re-connect suction and discharge lines from tube.

(8) Re-calibrate the pump and take note of the new flow rate for future reference

WIRING DIAGRAM



DISCLAIMER

Knight LLC does not accept responsibility for the mishandling, misuse, or non-performance of the described items when used for purposes other than those specified in the instructions. For hazardous materials information consult label, MSDS, or Knight LLC. Knight products are not for use in potentially explosive environments. Any use of our equipment in such an environment is at the risk of the user, Knight does not accept any liability in such circumstances.

FOOTNOTE

The information and specifications included in this publication were in effect at the time of approval for printing. Knight LLC reserves the right, however, to discontinue or change specifications or design at any time without notice and without incurring any obligation whatsoever.

WARRANTY

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