

# ILS Max & ILS OPL's AUTOMATIC MODE

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## WHY AUTOMATIC MODE?

Automatic mode was created to eliminate the need for formula selectors on the washer, reduce programming time, and allow accurate triggering even when the washer trigger signals vary in length. As such it:

- Reduces programming time compared to relay mode, since you don't have to calculate a variety of different trigger lengths
- Eliminates the need for formula selectors, reducing your install time and cost per washer (by about \$170 per washer)
- Reduces operator errors from picking the wrong formula number on the formula selector
- Increases dosing accuracy compared to relay mode, since in relay mode if the trigger is sometimes longer or shorter, you'll end up with more or less chemical
- Datalogging can take place using an AFS signal, or by load classification criteria
- Automatic mode allows for easy formula adjustment on the dispenser by changing a function, rather than changing programming on the washer. (It's easier to keep field personnel trained on one dispenser than on all washers)

## WHAT IS AUTOMATIC MODE?

Both formula and relay mode use a single trigger to call for a chemical or chemicals. Automatic mode uses multiple signals, called a "function", to request up to three chemicals.

On newer washers, you'd program the washer to turn on the signals you want for the function in question. Five seconds after the first trigger comes on, the dispenser looks for trigger signals, and those that are on determine the function per the chart below.

Function	T1	T2	T3	T4	T5	T6
1		OFF	OFF	OFF	OFF	OFF
2		ON	OFF	OFF	OFF	OFF
3		OFF	ON	OFF	OFF	OFF
4		ON	ON	OFF	OFF	OFF
5		OFF	OFF	ON	OFF	OFF

So, if trigger #2 (T2) comes on by itself, function #2 is called. If triggers 2 & 3 are present, function 4 is called. When a function is called, pumps programmed for that function will run.

You probably noticed trigger 1 (T1) isn't used in the example above. T1 is reserved as a "strobe signal". The triggering above is "strobeless", without using T1. The triggering above assumes a newer washer, where the signals turn on when they are supposed to, so they are all on before the 5 second window elapses. On an older chart controlled washers, the signals may not all come on within 5 seconds of one another. In this situation, we turn on the signals, and then we turn on the trigger 1 (T1) strobe signal. Five seconds after the strobe has been turned on, the system looks at which triggers are present and thereby determines which function is required. So, on older chart washers, the T1 strobe is turned on for each function, while on a newer washer the T1 strobe signal isn't programmed.

The chart below shows the signals for all 32 functions, with "----" indicating the signal stays off. Note function #1 is only available in strobe mode, since it has no triggers and needs strobe T1 to set the 5 second triggering window.

Function	T2	T3	T4	T5	T6
1	----	----	----	----	----
2	ON	----	----	----	----
3	----	ON	----	----	----
4	ON	ON	----	----	----
5	----	----	ON	----	----
6	ON	----	ON	----	----
7	----	ON	ON	----	----
8	ON	ON	ON	----	----
9	----	----	----	ON	----
10	ON	----	----	ON	----
11	----	ON	----	ON	----
12	ON	ON	----	ON	----
13	----	----	ON	ON	----
14	ON	----	ON	ON	----
15	----	ON	ON	ON	----
16	ON	ON	ON	ON	----
17	----	----	----	----	ON
18	ON	----	----	----	ON
19	----	ON	----	----	ON
20	ON	ON	----	----	ON
21	----	----	ON	----	ON
22	ON	----	ON	----	ON
23	----	ON	ON	----	ON
24	ON	ON	ON	----	ON
25	----	----	----	ON	ON
26	ON	----	----	ON	ON
27	----	ON	----	ON	ON
28	ON	ON	----	ON	ON
29	----	----	ON	ON	ON
30	ON	----	ON	ON	ON
31	----	ON	ON	ON	ON
32	ON	ON	ON	ON	ON

Notes:

- While 32 functions are available per washer, most installers don't need nearly that many.
- If you only have three triggers, you can use functions 2-8 assuming you're in strobeless automatic mode such that T1 is not used;
- If you have only four triggers, you can use functions 2-16.
- If you have five triggers, you can use 31 functions.
- If you have 6 triggers, you can use either all 32 functions using one trigger as a strobe on an older machine, or use functions 2-32 + AFS.

## HOW TO USE AUTOMATIC MODE

This section takes you through the steps needed to set up automatic mode. The first step is the same as what you'd do for formula or relay mode.

STEP 1 MAKE CHART OF YOUR FORMULAS			
Formula Name	Prewash	Main Wash	Final Rinse
Color towel	X	Alk 5 oz, Det 6 oz, Peroxide 8 oz	Sour 2 oz, Soft 2 oz
Color sheets	X	Alk 5 oz, Det 6 oz, Peroxide 8 oz	Sour 2 oz, Soft 2 oz
Color tablecloth	Alk 5 oz, Det 6 oz	Alk 8 oz, Det 12 oz, Peroxide 15 oz	Sour 2 oz
White towel	X	Alk 5 oz, Det 6 oz, Peroxide 8 oz	Sour 2 oz, Soft 2 oz
White sheets	X	Alk 5 oz, Det 6 oz, Peroxide 8 oz	Sour 2 oz, Soft 2 oz
White tablecloth	Alk 8 oz, Det 10 oz	Detergent 10 oz, Bleach 8.5 oz	Sour 2 oz
New linen	X	Det 6 oz	X
Rewash	Alk 8 oz, Det 10 oz	Bleach 12 oz	X
Mop & Rag	Alk 8 oz, Det 10 oz	Alk 8 oz, Det 12 oz, Peroxide 15 oz	Sour 2 oz
Blankets	Alk 8 oz, Det 10 oz	Alk 5 oz, Det 6 oz, Peroxide 8 oz	Sour 2 oz, Soft 2 oz

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## STEP 2 MAKE SIMILAR DOSE SIZES THE SAME FOR EASY PROGRAMMING

For example, dose sizes within 0.5 oz of one another might be consolidated to one size, and function.  
For example, in the chart below, if some doses were 4.5 oz of alkali and some 5 oz, standardize on 5

## STEP 3 MAKE CHART OF DOSE FUNCTIONS

Function #			
2	Alkali 5 oz	Detergent 6 oz	
3	Alkali 5 oz	Detergent 6 oz	Hydrogen peroxide 8 oz
4	Alkali 8 oz	Detergent 10 oz	
5	Alkali 8 oz	Detergent 12 oz	Hydrogen peroxide 15 oz
6	Detergent 10 oz	Bleach 8.5 oz	
7	Bleach 12 oz		
8	Sour 2 oz	Softener 4 oz	
9	Softener 4 oz		
10	Sour 2 oz		
11	Detergent 6 oz		

The chart of dose functions is really just a list of the various chemical combinations used in all the formulas. Some, such as function 1 and 3, can be characterized as “prewash light soil” and “prewash heavy soil”, and they’d then be used across multiple formulas. Function #7, sour and softener, would similarly be used on several of the formulas.

## STEP 4 MAKE CHART SHOWING WHICH FUNCTIONS GO WITH WHICH FORMULA

	Prewash	Main Wash	Final Rinse
Color towel	X	3	8
Color sheets	X	3	8
Color tablecloth	2	5	10
White towel	X	3	8
White sheets	X	3	8
White tablecloth	4	6	10
New linen	X	11	
Rewash	4	7	X
Mop & Rag	4	5	10
Blankets	4	3	8

All we’ve had to do in the step above is document the function numbers assigned to the chemical groups required, from our original formula sheet in yellow. Last, we look at which triggers need to be turned on to call these functions. By writing it down in chart form, it makes programming the washer faster.

## STEP 5 PROGRAM WASHER

	Prewash	Main Wash	Final Rinse
Color towel	X	T3	T2, T3, & T4
Color sheets	X	T3	T2, T3, & T4
Color tablecloth	T2	T4	T2 & T5
White towel	X	T3	T2, T3, & T4
White sheets	X	T3	T2, T3, & T4
White tablecloth	T2 & T3	T2 & T4	T2 & T5
New linen	X	T3 & T5	
Rewash	T2 & T3	T3 & T4	X
Mop & Rag	T2 & T3	T4	T2 & T5
Blankets	T2 & T3	T3	T2, T3, & T4

## DATALOGGING IN AUTOMATIC MODE

Automatic mode datalogging is the same as other modes. Chemical usage is logged based on pump runtime and calibration rates. Formula counts are logged based on formulas being selected by either a FS1600 formula selector, an AFS (auto formula select) signal, or by programming load classification setups. Automatic mode, like relay mode, assumes no formula selector is being used for purposes of convenience etc., so we'll discuss the latter two options here.

### 1. AFS

To use AFS, you need to attach a trigger from the washer to the T7 input on the same trigger module as is used for the function triggers in Automatic mode. By comparison, this same trigger input is used for AFS in formula mode, but in relay mode module #3 T6 is used. AFS signal on-time will then determine the formula logged, where formula number = trigger on-time of 2+4 x formula number, such that trigger on-time is per the chart on the right.

Formula #	T7 On-time Required	
1	6 seconds	+/- 0.5 seconds
2	10 seconds	+/- 0.5 seconds
3	14 seconds	+/- 0.5 seconds
4	18 seconds	+/- 0.5 seconds
5	22 seconds	+/- 0.5 seconds
6	26 seconds	+/- 0.5 seconds
7	30 seconds	+/- 0.5 seconds
8	34 seconds	+/- 0.5 seconds
9	38 seconds	+/- 0.5 seconds
10	42 seconds	+/- 0.5 seconds
11	46 seconds	+/- 0.5 seconds
12	50 seconds	+/- 0.5 seconds
13	54 seconds	+/- 0.5 seconds
14	58 seconds	+/- 0.5 seconds
15	62 seconds	+/- 0.5 seconds
16	68 seconds	+/- 0.5 seconds
30	122 seconds	+/- 0.5 seconds

AFS is easier to understand and set up than load classification setups.

However, because AFS requires an additional trigger, and needs the trigger length to vary by under 0.5 seconds, it may not be suitable for all installations.

AFS identifies loads up to formula #30 for data tracking purposes.

### 2. Load Classification Setups

These criteria allow the system to categorize loads by formula number, based on trigger signals 1-5 that were present during the load, and the number of drains. In the Step 5 pink chart above, we see the trigger counts that would be programmed, along with the number of drains. We'd program these as the load classification setups, as shown in the graphic below.

#	Classification	Run Time	Drain Count	Trig 1 Count	Trig 2 Count	Trig 3 Count	Trig 4 Count	Trig 5 Count	Weight
11	COL VISA NAPS	26	6	1	1	0	1	0	700
12	COL COT NAP/TOP	28	6	2	2	0	1	0	850
13	WHT. COTTON TOPS	38	8	1	2	1	1	0	850
14	WHT. APRONS	50	13	2	2	1	1	0	880
15	WHT. VISA NAPS	39	8	1	1	1	1	0	700
16	#2 BLU BAR/GRILL	47	13	2	2	0	0	0	1000
17	NEW LINEN	12	5	0	0	0	1	0	800
18	BAGS	8	3	0	1	0	0	0	1200
19	COL MOTEL TERRY	18	5	1	1	0	1	1	1000
20	BLUE DYE	12	4	0	0	0	0	0	1200
21	STAIN TREAT WHT	95	13	1	1	1	1	0	1100

Note that run time and weight are put in as expected values, but are not used for identifying which load is in the washer. Only drain and trigger signal counts are used in load identification; weight is used for generating cost/kg or cost/lbs data, and run time is used to show when excess runtime occurs. Note also that T6 is not used for load classification setups.

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In our load classification example above, the trigger and drain counts are different for each formula. I.e., each formula has a unique footprint, so the system can identify it and track loads. In our automatic mode programming example, however, Step 5 in pink shows some loads receiving the same chemistry. If they have the same drains as well, our load classification setups would have no way to tell the difference between them.

If you're in *strobeless automatic* mode, you aren't using T1 to call functions, and you could have it turn on for five seconds simply to differentiate between formulas which are otherwise the same as follows:

STEP 5 PROGRAM WASHER				
	Formula log signal	Prewash	Main Wash	Final Rinse
Color towel		X	T3	T2, T3, & T4
Color sheets	T1	X	T3	T2, T3, & T4
Color tablecloth		T2	T4	T2 & T5
White towel		X	T3	T2, T3, & T4
White sheets	T1 + T1 (two times)	X	T3	T2, T3, & T4
White tablecloth		T2 & T3	T2 & T4	T2 & T5
New linen		X	T3 & T5	X
Rewash		T2 & T3	T3 & T4	X
Mop & Rag		T2 & T3	T4	T2 & T5
Blankets		T2 & T3	T3	T2, T3, & T4

Of course, if multiple formulas were otherwise the same, we could turn in on several times as shown in the second yellow cell above.

If you're in strobe automatic mode as on an older chart controlled machine, T1 will be getting used with each function, so each function will have T1 occur with it. In this case, we can have T2 act as our differentiating trigger. As long as it doesn't occur with T1, it will be ignored since it won't call for a function without the strobe in strobe mode.

STEP 5 PROGRAM WASHER				
	Formula log signal	Prewash	Main Wash	Final Rinse
Color towel		X	T1 & T3	T1, T2, T3, & T4
Color sheets	T2	X	T1 & T3	T1, T2, T3, & T4
Color tablecloth		T1 & T2	T1 & T4	T1, T2 & T5
White towel		X	T1 & T3	T1, T2, T3, & T4
White sheets	T2 twice, or T3	X	T1 & T3	T1, T2, T3, & T4
White tablecloth		T1, T2 & T3	T1, T2 & T4	T1, T2 & T5
New linen		X	T1, T3 & T5	X
Rewash		T1, T2 & T3	T1, T3 & T4	X
Mop & Rag		T1, T2 & T3	T1 & T4	T1, T2 & T5
Blankets		T1, T2 & T3	T1 & T3	T1, T2, T3, & T4

## TROUBLESHOOTING LOAD CLASSIFICATION SETUPS

Generally load classification is reliable with newer washers. With older chart control washers, however, flickering triggers can occur, resulting in the load not matching criteria, such that it is logged as 'Unidentified Load'. Another issue is when the washer is stopped for some reason and then restarted by the operator; the dispenser will see this as two short loads, again "Unidentified Loads."

In an activity-based billing environment, we suggest an agreement be struck with the customer that these performance issues are due to the washer and operator, and that they be billed for partial or “Unidentified Loads.”

Alternately, one could use AFS, which sets cycle at the beginning of the wash process, such that unidentified loads would not be recorded, but instead two loads would be recorded if they stopped the washer mid cycle and then resumed, since the formula is logged as complete when the washer on signal turns off.

To troubleshoot Unidentified Load records, the easiest tool to use is the Cycle Records Report. As shown below, it shows how many triggers and drains occurred, and you can then match this up against your programmed load classification setups to see if the drains or triggers were counted and programmed incorrectly.

The screenshot shows the 'Cycle Records' software interface. At the top, there is a menu bar with 'File', 'Record', and 'Communicate'. Below the menu is a toolbar with buttons for 'Retrieve', 'Dispenser', 'Washer', and 'Record'. The main title is 'Sample DF2 Site'. Below the title is a table with the following columns: Date, Time, Washer #, Drains, Trigger 1, Trigger 2, Trigger 3, Trigger 4, Trigger 5, Trigger 6, and Trigger 7. The table contains 20 rows of data, showing cycles from 16-Apr-1999 to 19-Apr-1999. The status bar at the bottom indicates 'Not Connected' and the time '12:32:46 PM'.

Date	Time	Washer #	Drains	Trigger 1	Trigger 2	Trigger 3	Trigger 4	Trigger 5	Trigger 6	Trigger 7
16-Apr-1999	03:28 AM	1	6	2	2	0	1	0	0	
16-Apr-1999	04:31 AM	2	5	1	1	0	1	0	0	
16-Apr-1999	04:37 AM	3	7	1	1	1	1	0	1	
16-Apr-1999	04:54 AM	1	6	2	2	0	1	0	0	
16-Apr-1999	05:17 AM	2	7	1	2	1	1	0	1	
16-Apr-1999	05:32 AM	3	7	1	2	1	1	0	1	
16-Apr-1999	05:45 AM	1	5	1	1	0	1	0	0	
16-Apr-1999	06:29 AM	3	7	1	1	1	1	0	1	
16-Apr-1999	06:32 AM	2	10	1	1	1	1	0	1	
16-Apr-1999	06:38 AM	1	7	1	2	1	1	0	1	
16-Apr-1999	07:22 AM	3	7	1	1	1	1	0	1	
16-Apr-1999	07:34 AM	1	9	1	1	1	1	0	1	
16-Apr-1999	07:41 AM	2	8	1	1	1	1	0	1	
18-Apr-1999	10:05 PM	3	9	1	1	1	1	0	1	
18-Apr-1999	10:14 PM	2	10	2	2	1	1	0	1	
18-Apr-1999	10:21 PM	1	11	1	1	1	1	0	1	
18-Apr-1999	11:09 PM	3	8	1	1	1	1	0	1	
18-Apr-1999	11:23 PM	1	4	0	1	0	0	0	0	
18-Apr-1999	11:28 PM	2	4	0	1	0	0	0	0	
19-Apr-1999	12:10 AM	1	4	0	1	0	0	0	0	
19-Apr-1999	12:15 AM	2	7	1	1	1	1	0	1	