

PLC implementation of the bottle-filling application

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PLC implementation of the bottle-filling application (photo credit: khs.com)

Detection of position

In this example (see Figure 1), we will implement a control program **that detects the position of a bottle via a limit switch**, waits 0.5 seconds, and then fills the bottle until a photosensor detects a filled condition.

After the bottle is filled, the control program will wait 0.7 seconds before moving to the next bottle. The program will include start and stop circuits for the **outfeed motor** and the start of the process. Table 1 shows the I/O address assignment, while Tables 2 and 3 present the **internal and register assignments**, respectively.

These assignments include the start and stop process signals.

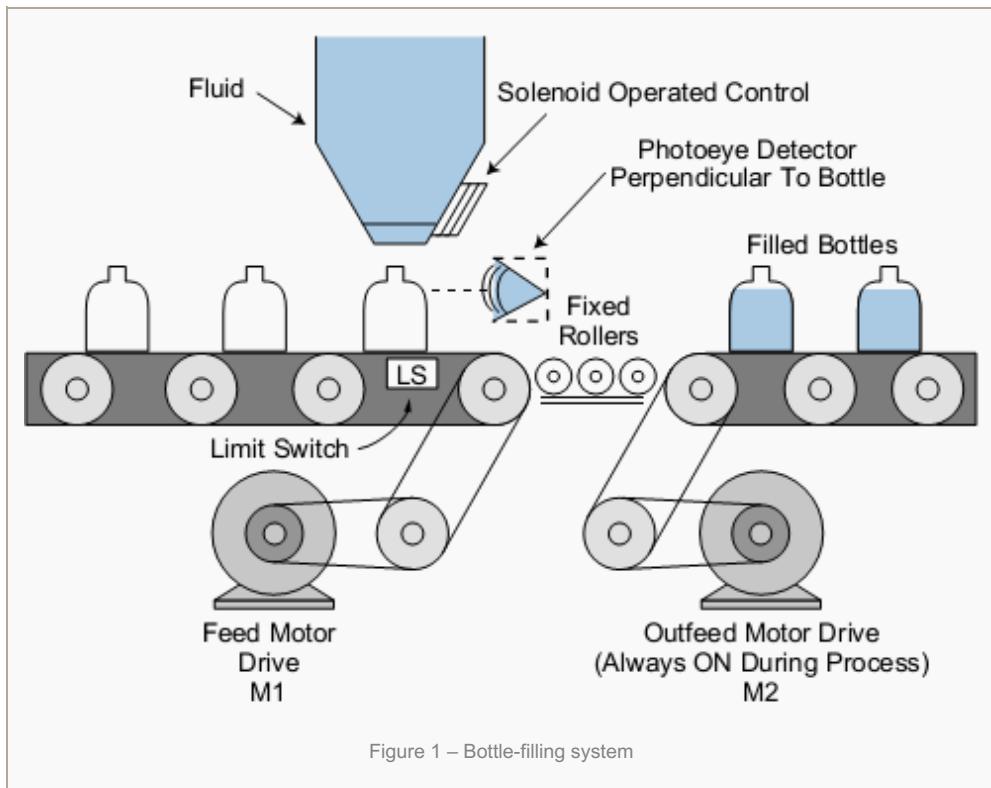


Table 1 – I/O address assignment

		I/O Address			
Module Type	Rack	Group	Terminal	Description	
Input	0	0	0	Start process PB1	
	0	0	1	Stop process PB2 (NC)	
	0	0	2	Limit switch (position detect)	
	0	0	3	Photoeye (level detect)	
Output	0	3	0	Feed motor M1	
	0	3	1	Outfeed motor M2 (system ON)	
	0	3	2	Solenoid control	
	0	3	3	—	

Table 2 – Internal output assignment

Device	Internal	Description
Timer	1001	Timer for 0.5 sec delay after position detect
Timer	1002	Timer for 0.7 sec delay after level detect
—	1003	Bottle filled, timed out, feed motor M1

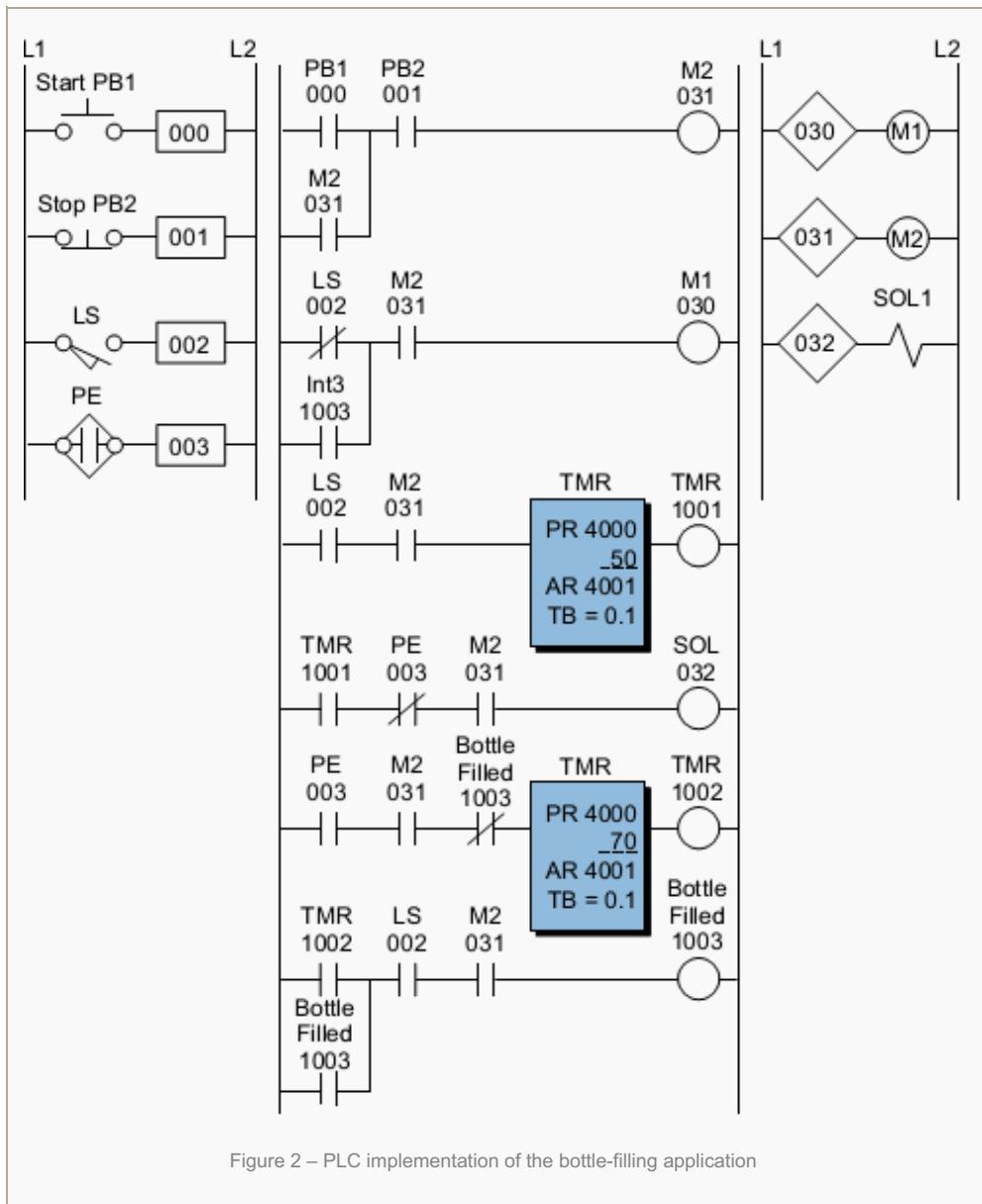
Table 3 – Register assignment

Register	Description
4000	Preset value 5, time base 0.1 sec (1001)
4001	Accumulated value for 1001
4002	Preset value 7, time base 0.1 sec (1002)
4003	Accumulated value for 1002

Figure 2 illustrates the [PLC ladder implementation](#) of the bottle-filling application. Once the start push button is pushed, the outfeed motor (**output 031**) will turn ON until the stop push button is pushed.

The **feed motor M1** will be energized once the system starts (**M2 ON**); it will stop when the limit switch detects a correct bottle position. When the bottle is in position and 0.5 seconds have elapsed, the solenoid (**032**) will open the filling valve and remain ON until the photoeye (PE) detects a proper level.

The bottle will remain in position for 0.7 seconds, then the energized internal **1003** will start the feed motor. The feed motor will remain ON until the limit switch detects another bottle.



Reference: *Introduction to PLC Programming and Implementation – from relay logic to PLC logic – globalautomation.info*