Subroutine Project

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Our PLC program is designed to create a pulse width modulation (PWM) that can be adjusted by the operator. The operator is able to increase or decrease the duty cycle by using push buttons. Holding down one push button will increase the duty cycle and by holding down a separate push button the duty cycle will be decreased. The program works with a make clock pulse instruction block, with the on time set to 1 millisecond and the off time set by a work address that will vary. Holding the increment input down will increase the value being stored in the work address, increasing the off time for the clock pulse. The same idea is applied decrement input except it will decrease the off time for the clock pulse.

We did encounter a few problems when designing our program. Our first problem was figuring out what we could use to create PWM. Looking through previous labs we were able to find that there was an instruction block to make clock pulses, which was exactly what we needed. When testing our program we found that the motor was running very slowly. We found that this problem was caused by clock pulses being too long. The problem was solved by switching out the regular clock pulse instruction block for a millisecond clock pulse instruction block, allowing us to create quicker clock pulses. Another issue was the BCD increment/decrement functions would rapidly add up when a button was held; to fix this, a 0.1 second pulse contact was added and set to differential up. And the final problem we encountered was having the PWM rollover once it reached 0000 or FFFF. To fix this problem, we placed function blocks that would only allow the value in the work address to increment if the value is less than FFFF and to decrement only if the work address value is more than 0000.

This application could be applied to any system that only has digital output, but needs variable speed adjustment. It could be used for a conveyor belt, motor, light or any number of different components. In conclusion, we found our system to be functional and usable.