

Perfectly Poured Beverages Every Time

Automated Dispenser Designed for Craft Beer and Soda Enthusiasts

Contributed by Engineering Students at The Citadel Military College

Meet SmartPour, an automated beverage dispensing system designed to simplify owning and maintaining a home kegerator while ensuring quality and perfectly poured beverages. With a Microchip PIC18 at its heart, SmartPour automatically maintains appropriate pressure, monitors temperature and keg level, and automates the dispensing sequence to provide ease of use and professional quality pours at the touch of a button. RFID communication is used to pass ideal parameters for each beverage into the system, thus allowing this device to be adaptable to any keg based beverage on the market. Since the CO₂ concentration in beverages can vary

from brewery to brewery, and pressure is directly correlated with temperature, it is imperative that SmartPour monitors and adapts as these variables change.

Analog-to-digital conversion is used to convert data from a Microchip TC1046 temperature sensor and stored it on the PIC18 microcontroller. This data is then interpreted through a temperature/pressure lookup subroutine to identify the correct corresponding pressure. That data is then sent to an electro-pneumatic pressure regulator. SmartPour adjusts as the temperature varies, guaranteeing that CO₂ is neither leaked nor absorbed, maintaining equilibrium within the installed keg. Once the system is initialized, a beverage is ready to be poured.

When desired, a drink is just a press of a button away. Using pulse-width modulation, a stepper motor tilts the glass to the appropriate angle and begins the pour sequence by opening a solenoid valve. As the beverage is dispensed, a flow meter calculates pulses, or counts how much liquid is dispensed. Simultaneously, as pulses are counted, the motor begins to return the cradle system to its starting position. Pour angle and speed vary with each beverage but SmartPour adapts, leaving the proper amount of foam at the top of the glass each and every time.



Click to view the video of the team from The Citadel Military College explaining their project

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SmartPour has been developed with three main safety systems. A microswitch cup sensor is installed within the cradle system, which guarantees no pour sequence can begin without the installation of a cup. Additionally, a catch tray is designed to fit underneath the cradle and houses a moisture sensor. This sensor halts all function in the event of a spill. After the tray is cleaned, normal operation resumes. As a failsafe for all operations, a stop button can be pressed at any time during a pour. The solenoid valve then closes and the stepper motor returns the cradle and glass to its initial position.

From its RFID communication to its pressure regulation, SmartPour was developed at The Citadel Military College of

South Carolina as a prototype for a senior design project. For students William Creed, Joshua Decker, Joshua Kerr, and David Vandermolen, it has become much more than that. This automated beverage dispenser is not only useful but adds excitement to the craft beer or soda enthusiast. It ensures quality without prior knowledge and is even desirable in festivals. A year of integrating complex components into one centralized unit has led to the development of a fully functional prototype that is SmartPour. 