Smart metering: water meter with computer vision

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Introduction

Water meter devices play a crucial role in measuring and monitoring water consumption. These devices are designed to accurately quantify the amount of water consumed by residential, commercial, and industrial properties. By providing accurate and reliable data on water usage, water meter devices enable efficient billing and help detect potential leaks or abnormal usage patterns. With advancements in technology, modern water meter devices are equipped with smart features, allowing for remote monitoring, data analysis, and real-time alerts. Such devices not only promote water conservation and sustainability but also empower users with valuable insights to optimize their water usage and contribute to a more responsible and efficient water management system.

The development of a smart water meter system incorporating a camera for reading consumption numbers and transmitting them to users opens up new possibilities for water monitoring and analysis. By integrating a camera into the metering process, the system can capture accurate readings of consumption numbers with minimal manual intervention. These readings are then transmitted to the users, enabling them to access real-time data on their water usage. This empowers users to analyze their consumption patterns, identify trends, and make informed decisions regarding their water usage. With the ability to generate statistics based on this data, users can gain insights into their water consumption habits, set conservation goals, and take proactive measures to reduce waste. Ultimately, the combination of a camera-enabled smart water meter system and user data analysis contributes to promoting water efficiency and fostering a more sustainable approach to water management.

Materials and Methods

For this project we used:

1. A domestic water meter
2. ESP32-cam module (Specifications could be found here: link)
3. UartSBee v5.0 module (Specifications could be found here: link)
4. USB A cable to micro USB cable
5. MicroSD card
6. Jumper cables

Our final setup looks like that: