



# Beverage Monitoring

## with FlowCode

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## Company Overview

Datascap Industrial creates turnkey electronic and software systems that facilitate:

- **real-time** communication between systems,
- powerful edge computing,
- artificial intelligence integration,
- low-power, long-range networks and
- iOS and Android integration

Datascap combines expertise from the manufacturing industry and Low Power Sensory Networks to change up how we gather and manipulate data. This data will be the key to eliminating inefficiencies and maintaining resource-efficient operations.

## Project Description

There are many operational costs involved in the restaurant and bar industry that can be challenging to measure – and hidden costs which may never get discovered. A South African tech company has been hard at work keeping tabs on beverage consumption and operational expenditure for their clients.



They do this by equipping each beer and ale tap with a flowmeter that sends pour-data and other important key variables to the Cloud for processing. The data is scrutinized, condensed, and then put into a report for the clients' perusal.

Datascap was tasked with reconceptualizing their current hardware and adding some features that would make for an even better offering.

## Hardware

From this, a prototype that can accommodate the following features emerged:

- 10 flowmeters, along with a temperature and conductivity sensor built into each,
  - Temperature - used to gauge the quality of the poured beverage
  - Conductivity - to determine the strength and presence of the detergent and duration of any cleaning cycles.
- An RFID scanner,
  - For tracking assets related to the supply chain
- A series of other sensors
  - Tamper / Motion detection to determine the orientation of the unit
  - Auxiliary digital and analog inputs
  - Chiller temperature sensor
- Wi-Fi / LTE connectivity for the data backhaul
- Bluetooth for device configuration
- Long term backup storage
- Ability for a master device to act as a gateway for slaves that do not have LTE.

## Software

There are a total of three processors on-board to manage all the hardware, two of which run firmware built in FlowCode. FlowCode stood out in many ways as not only a feature-rich IDE, but also because of the format that the final product can be given to the client. Especially clients that may want to make small tweaks inhouse and may not be embedded experts.

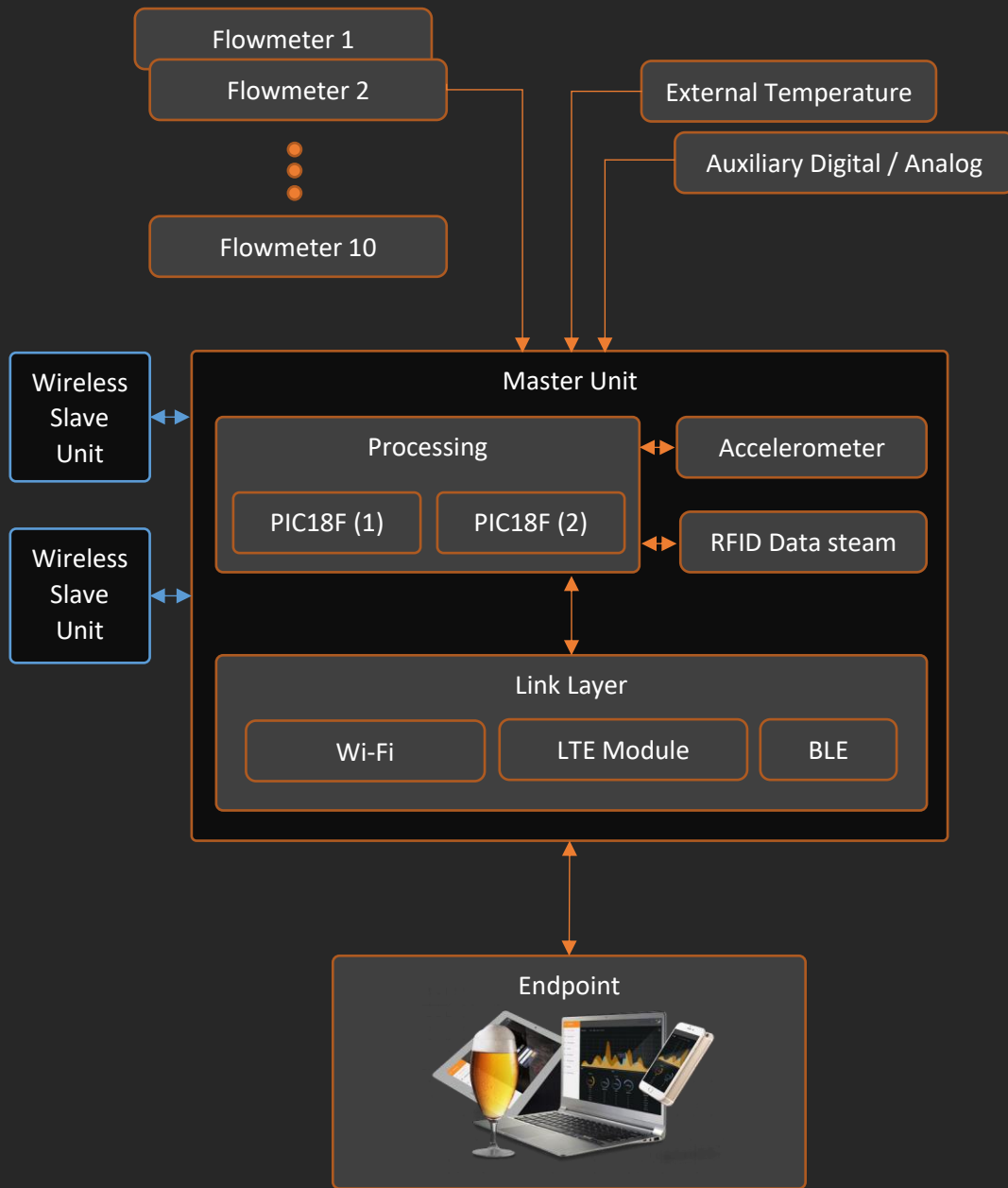
Most of the hard components that were chosen to make this project work, already had pre-built hardware libraries in FlowCode that could be dragged into place and configured. Modules that could have taken a couple of days or weeks to develop were already there, done and tested.

Beyond that, the code structure that emerged as the project grew was still easy to navigate, easy to debug, and well documented at the same time.

Over the course of the project, both 8bit PIC microcontrollers were programmed to the brim. The simulator was also of great help and was used extensively to run and debug hardware independent routines.

The third microprocessor is an Espressif ESP32 and is in line to get ported to FlowCode.

## Functional Overview



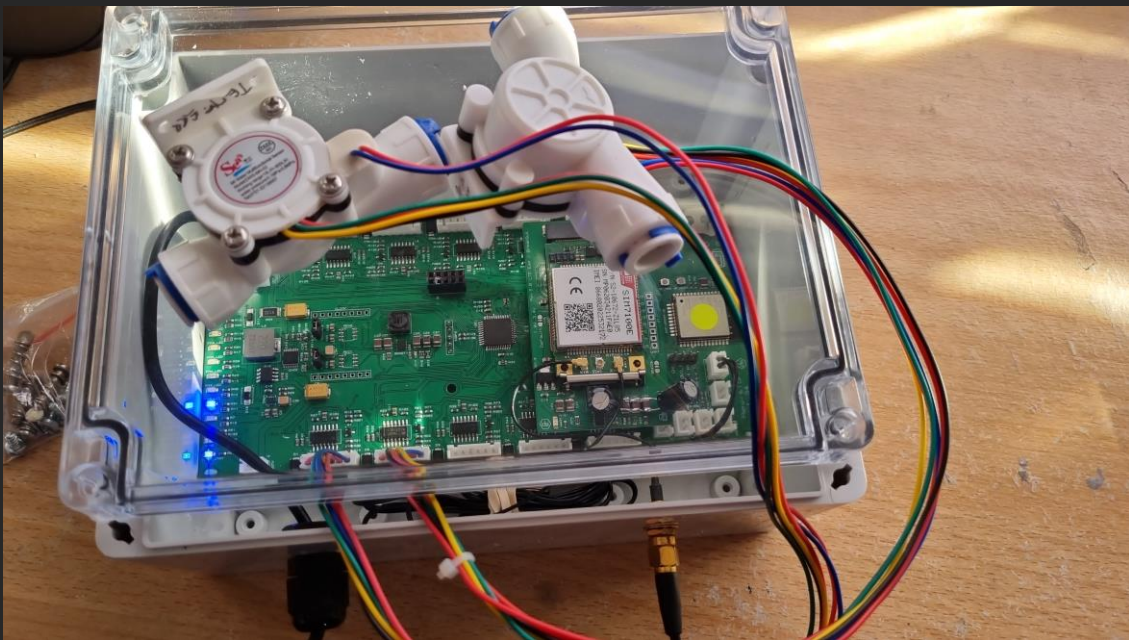
## Outcome

At the time of this writing, two units are undergoing stress tests to monitor their long-term performance. So far there have been no reboots or hang-ups and the connection from tap to Cloud is seamless. There is still work to be done on the server end, so for now, we continue testing and adding features to the end node. Using the 'disable' feature in FlowCode has made it easy to isolate experimental branches.

## Roadmap

FlowCode has proven to be a powerful tool for rapid development in this prototype. The code generated from the IDE will be put into production soon at a few small outlets to gather real-world data. From there, as more confidence is built in the latest code, the new replacement hardware will slowly get rolled out until all the legacy units are no more.

All future projects will be more than likely be built using the FlowCode IDE.



Final checks before closing the lid.



Test tap at a local company.



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