



CASE STUDY: HONEYWELL

Smarter Energy Measurements **Using Predictive Self-Learning Models**

The team at Honeywell was able to utilise Monolith's self-learning model capabilities to calibrate smart meters that allow residential users to track and predict their gas usage and expenditures and suppliers to provide more reliable and customised services.

Background

Most fluid dynamics problems, like natural gas mixtures flowing through a residential meter, are very difficult to resolve numerically. On top of that, test campaigns are notoriously expensive for engineering companies due largely to a heavy reliance on physical prototypes.

Tuning a Computational Fluid Dynamics (CFD) simulation until it is accurate enough for decision-making can take months, and significantly longer than testing a design on an in-facility test stand. Therefore, despite the trend of using CFD more often, testing very early in the product development process is critical.

Artificial Intelligence (AI) can be applied to this early test data in order to understand more quickly what impacts the results. Use the AI model to predict unperformed tests, and even to calibrate meters to high accuracy levels faster.

Monolith allowed us to understand and optimize the gas meter's behaviour for all operating conditions and optimize meter accuracy under extreme conditions, allowing us to build a superior, more accurate product in a much shorter amount of time.

Dr. Bas Kastelein Sr. Director Product Innovation Honeywell



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Collaboration

Improved teamwork

TEST LESS



Physical Testing Reduced by virtual testing



Time Skip time-intensive **CFD** simulations



Test Setup Optimal use of test facilities

AI Recommendation Less intuition, more facts



Application Smart Meters



Fulfilling Legal Requirements

Honeywell engineers would spend months tuning a CFD simulation to understand product performance and achieve a required level of accuracy for decision making.

Trying to understand the physics of a complex system like this can't be completed quickly or even fully represented by CFD simulation, and therefore requires extensive physical testing to calibrate. Between simulation and physical testing, this process could take 18 months to ensure the calibration error of the smart meters is below the legally required 1%.

From CFD to Self-Learning Models

Engineers at Honeywell explored how they could use AI to speed up product development and ensure accuracy and reliability of the sensors under more operating conditions. Using Monolith AI Software, the engineering team at Honeywell has reduced product development time by 25% and achieved product safety certification. This positions them to better compete for the fast-growing \$30B global smart meter market.

Deployment of AI Solutions

Through Honeywell engineers' visionary use of Monolith Al Software, they not only realised an increase in speed, but also in decisionmaking.

As their models get smarter with time and more data, they can now solve their most intractable physics challenges faster by reducing testing and simulation, becoming even more competitive and making our world a cleaner, more sustainable place to live.

From Computational Fluid Dynamics to Self-Learning Models



Reduce time and money spent testing: Attain more leverage from data collected during physical testing.



Select optimal changes more quickly: Discover the impact of changes inside a Monolith Notebook without returning to the test facility.

Retain knowledge: Maintain a competitive edge by drastically accelerating time-to-market.



Designing and optimizing a residential gas meter can be an expensive and time-consuming undertaking. Using Monolith, the engineers at Honeywell can optimize their gas meters much faster using a data-driven approach.



Investigating engineering test data, users can combine, transform and build self-learning models inside a no-code AI platform that accurately predict flow rates for multiple material types and devices with varying throughput capabilities such as radius, length, and other relevant device measurements.





About Monolith

Monolith software is trusted by the world's top engineering teams including Kistler, Siemens, Honeywell, and BMW to develop better quality products in half the time. Backed by one of world's largest software investors and recognized by Gartner as a Cool Vendor for Al in Automotive, Monolith Al empowers engineering domain experts in automotive, aerospace and industrial markets to reduce expensive, time-intensive testing, lower risks to product performance and quality, and cut product development time. Featured in Forbes magazine and named one of the UK's top 100 startups.