Welcome to the World of
Data Driven Solutions.

An Overview of QH FLUIDTREND™ Digital Fluid Optimization

QH FLUIDTREND™

Quaker Houghton

QH FLUID INTELLIGENCE™

Quaker Houghton™

Measure, Control, Optimize.

At Quaker Houghton our objectives are clear: to develop and provide a long-term digitization strategy that supports our clients' own business growth, keeping customers highly competitive in an ever-changing world.

Our goal for QH FLUID INTELLIGENCE™ is to bring differentiated value to our customers so they can operate safely, sustainably and at the lowest total cost of ownership. Our comprehensive process fluid portfolio together with our equipment and sensor technology, QH FLUIDTREND software, and expert engineering services delivers the ultimate fluid optimization solution for Industry 4.0, QH FLUID INTELLIGENCE™.

Through our industry specific application and technology expertise in fluids and the use of our software and hardware technology, we can lead the way to take our customers on a journey of digital transformation and smart manufacturing.

We keep our customers at the forefront of the transformative benefits that digitization delivers through QH FLUIDTREND™. This tailored, cloud software program was developed by Quaker Houghton to support your process fluid operations and our global laboratories.

Advanced inputs with the use of sensor technology captures data in real-time, and provides reports and analytics allowing fact-based decisions. Imagine analytics have informed you that a production line will fail at a set point in the near future; the same data confirming if cycle times were to be reduced by 20% production could continue for a four weeks all resides within a scheduled maintenance program.

Minimize downtime, no reactive maintenance and manufacturing capacity can be measured and aligned.

MEASURE

Best in class and differentiated sensors that measure the right parameters accurately and reliably for various manufacturing processes.

CONTROL

Using our domain of expertise and our cloud platform to digitally capture data, use data visualization to analyze and deliver actionable insights to optimize fluid performance.

OPTIMIZE

Leverage historical data and Machine Learning to correlate fluid performance with machine performance. Deliver predictive and preventative insights that will increase tool life, reduce unplanned downtime and reduce cost per machined part.

QH FLUIDTREND™

Quaker Houghton™

The Software Solution that Helps Businesses Manage, Automate, and Streamline their Operations.

QH FLUIDTREND™ is designed for smart manufacturing and optimum fluid management. This eliminates the need for manual processes, delivering end to end visibility of your production processes in a paperless environment. The data provided offers increased visibility of your assets, ultimately enabling you to extend their lifespan, reducing both downtime and maintenance costs.

QH FLUIDTREND™ Customer Portal dashboard provides instant reports by application point, such as top leakers, top fluid usage, and cost analysis and usage trends. In addition, management reports aid compliance with Environmental, Health & Safety (EHS) guidance on the control and disposal of process fluids. All generated Site Reports are available in multi-language file formats and with an easy to view traffic-light system.

QH FLUIDTREND™ Generate self-service dynamic Analytical Reports; to any custom production scenario, confirming powerful data insights, allowing informed decisions to preventative maintenance trends and cost savings. Enhancing manufacturing activities with confidence that production is running as efficiently as possible. Ultimately managing and controlling industrial process fluids increases fluid lifetime, reducing waste and environmental impact.

QH FLUIDTREND™ The ultimate performance and maintenance solution that digitally models your fluids and systems.

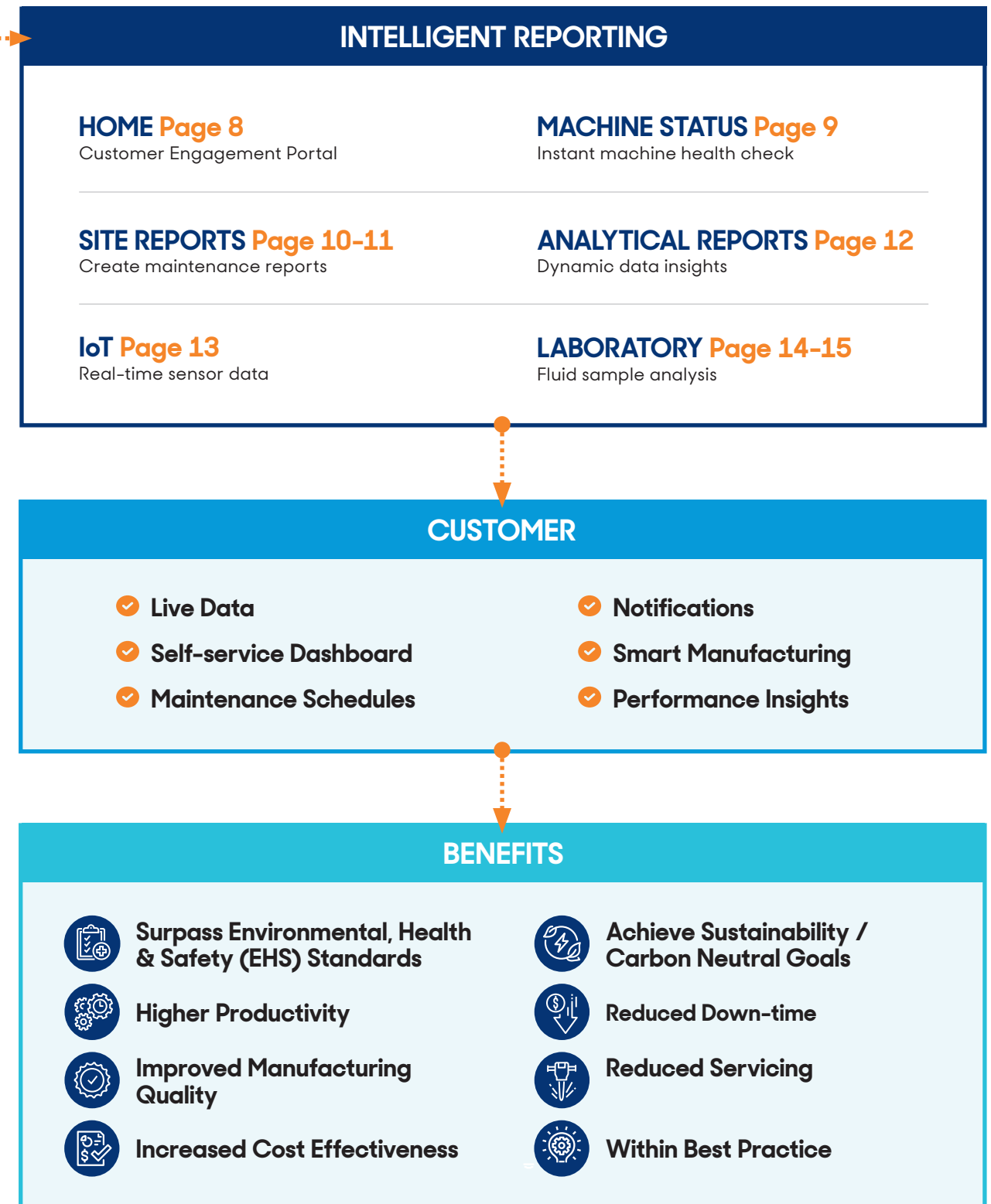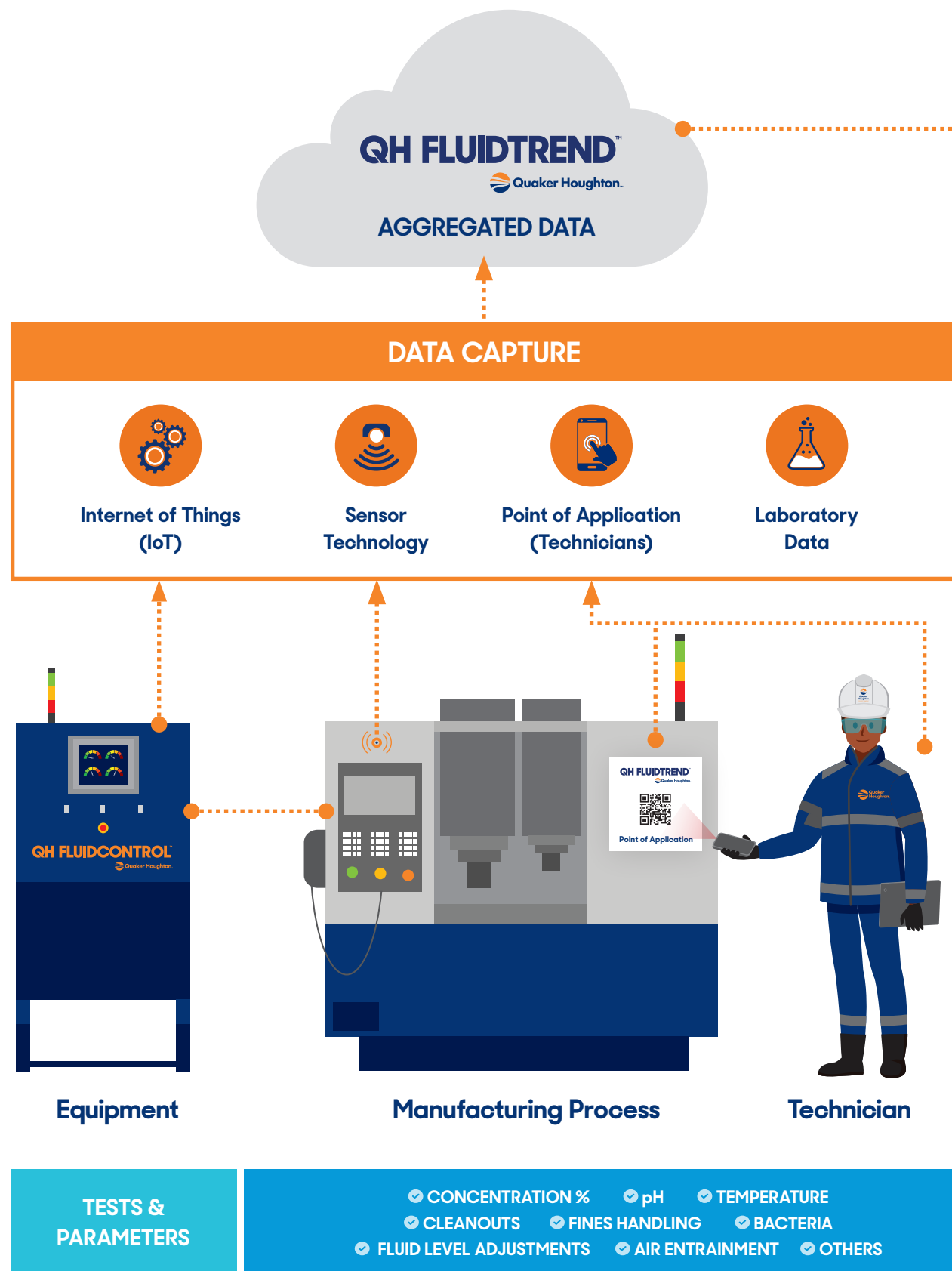## Entire Fluid Optimisation and Maintenance Management

The implementation of digital and sensor technology to enhance and optimise fluid performance, as well as the ability to schedule and organise tasks, allows data to be captured and supplied in visual and paperless reporting structures, delivering peak-performance in manufacturing.

Tests and tasks are recorded using an industrial data-logger with QR scanner; customer privacy is protected by camera disabling software. All activities are synched real time or at the beginning and end of a shift, allowing technicians to complete their work offline without an internet connection if needed.
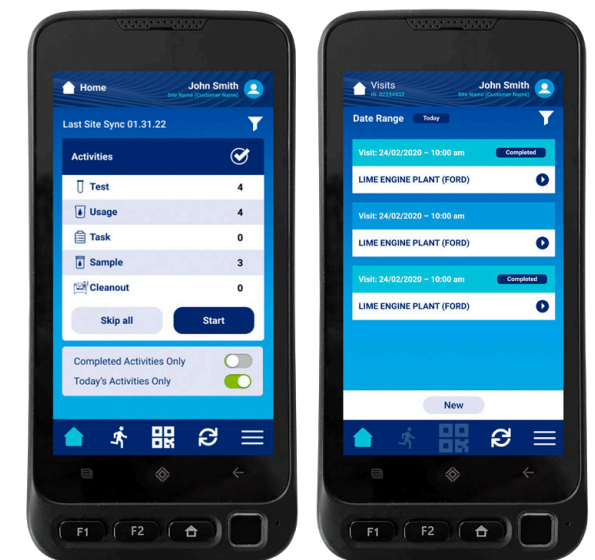
▲ The QH FLUIDTREND™ data logger app used by Technicians to view work schedules and input test data.

QH FLUIDTREND™ How does it work?

QH FLUIDTREND™
Quaker Houghton

AGGREGATED DATA

DATA CAPTURE

Internet of Things (IoT)

Sensor Technology

Point of Application (Technicians)

Laboratory Data

QH FLUIDCONTROL
Quaker Houghton

QH FLUIDTREND™
Quaker Houghton
Point of Application

Equipment

Manufacturing Process

Technician

TESTS & PARAMETERS

- CONCENTRATION %
- pH
- TEMPERATURE
- CLEANOUTS
- FINES HANDLING
- BACTERIA
- FLUID LEVEL ADJUSTMENTS
- AIR ENTRAINMENT
- OTHERS

INTELLIGENT REPORTING

HOME Page 8
Customer Engagement Portal

MACHINE STATUS Page 9
Instant machine health check

SITE REPORTS Page 10-11
Create maintenance reports

ANALYTICAL REPORTS Page 12
Dynamic data insights

IoT Page 13
Real-time sensor data

LABORATORY Page 14-15
Fluid sample analysis

CUSTOMER

- Live Data
- Notifications
- Self-service Dashboard
- Smart Manufacturing
- Maintenance Schedules
- Performance Insights

BENEFITS

- Surpass Environmental, Health & Safety (EHS) Standards
- Achieve Sustainability / Carbon Neutral Goals
- Higher Productivity
- Reduced Down-time
- Improved Manufacturing Quality
- Reduced Servicing
- Increased Cost Effectiveness
- Within Best Practice

Home.

Your Personalised, Central Portal

The dashboard is your personalised, central hub of QH FLUIDTREND™. Here, you can configure reports to your exact specifications and have them instantly available as you log in.

Easily customisable, QH FLUIDTREND™ enables you to view a variety of information including an overview of test data from your machines, a view of machines that are out of specification (which you can use to diagnose any issues that occur) or graphs that compare the percentage of in-and-out of specification tests.

With the global search, you can quickly find and jump between individual machines and Points Of Application (POAs), allowing you an effective way of checking on the statuses of that machine or POA.

Built with usability as a key element of QH FLUIDTREND™, your dashboard is adaptive to your devices screen size. As long as your device has an active internet connection, you can access the power that QH FLUIDTREND™ provides your business.

Features & Benefits

- Quickly view important data at a glance
- Intuitive and responsive user interface
- Easy to use left hand navigation
- Customisable to view the real-time data that's important to you
- Quick links to other areas of the portal

Machine Status.

Machine Status

The machine status page displays historical data for any given machine, alongside its Point of Applications (POAs). Utilise the traffic light status system to quickly scan and identify any issues. Date filters allow you to select data for a specific period.

The machines profile enables the user to view the machines location, capacity, cleanout information, the fluid utilised and its test statuses. Alongside this, a table summary gives information on the history of each of the core tests - data is then broken down further into each test.

- Determine the costs and usage of a product within a machine
- Detailed, multi-format data analysis
- Real-time date filters that allow you to access up to a years worth of information
- Trend data for multiple POAs
- Generate PDF reports on the machine

Machine Cards

- Simple traffic light status system, the color-coded cards allow you to quickly scan across your range of machines
- The machine cards display a range of quick information, including: Days since last cleanout, Bacteria status, Concentration status, pH status
- Target areas of your factory with easy-to-use filters that organise your machines by site and location
- Save the current filter as your preferred, default view
- Change the view to your preference – card or list view
- Sorted by how the machines are located within each location

◀ ## Instant Machine Health Check

The machines section of QH FLUIDTREND™ gives you an overview of the status of all of the machines within your factory. Using a simple traffic light status system, the colour-coded cards allow you to quickly scan across your range of machines – with the ability to click into that machine and investigate deeper into any issues.

Site Reports.

Create Maintenance Reports

With all the data that is continually being fed into QH FLUIDTREND™, analysing and comparing it in order to get the most meaningful data for your business can be difficult.

With site reports, this issue is removed with a set of reporting tools giving you the power to easily get the data that you need. With the inclusion of filters, you're able to take your entire QH FLUIDTREND™ dataset and manipulate it to only show the information required. You can then view the results dynamically in "Online Mode" or as a downloadable PDF in "Print Mode".

Features & Benefits

- Compare costs by product, machine and location
- Compare fluid usage by machine and product
- Generate reports on all test data over desired time period
- Real-time date filters that allow you to access up to a year's worth of information
- Filter results to only the data that matters

Standard Reports

QH FLUIDTREND™ comes with a set of reports that allow you to get an overview of different datasets from across the portal. Each report type allows you to filter the data down to show only the results that you are interested in. Depending on the report type, you can filter by a pre-defined or custom data range, location, or even a specific Point of Application.

Activity Completion Report: generates a report based on the different activities that have been completed by your Technician so you can easily see what's going on.

Daily Activity Report: generates a report based on the different results that have been submitted by your Technician on a specific date to see what tests have been performed.

Machine History Report: generates a report based on the history of specific machines to see the history of test results, useful to help highlight recurring trends. You can also specify how you want the data to be shown, as a chart, table, or both.

Product Usage Report: generates a report based on the usage of different products against machines, and the cost of that product. Here, you can see the total amount of product usage across your factory. With the inclusion of total product cost, your Technician can also investigate whether the usage is higher than usual, or ways to reduce costs.

Cost Report: generates a report based on the costs of different products against all your machines, along with the total volume used to easily see the total fluid costs of maintaining your factory.

Analytical Reports.

Dynamic Data Insights

With the power of Analytical reports you can request custom built reports about a wide variety of data inputs to collate and view a report that gives you all the details you need (general or minute) to help you ensure your machines and business are running as smoothly and profitably as possible.

Go from data to insights and insights to action with QH FLUIDTREND™ to easily build business applications and automate workflows.

With Analytical reports, real-time data can be visualised in order for you to make accurate decisions based on what's happening now, instead of hours or days ago.

Features & Benefits

- Utilise machine learning to highlight key, actionable information
- Deepen your data insights with analytics
- Visualise data how you want to
- Analyze all historical data to provide meaningful trends and predictions

Not Just Your QH FLUIDTREND™ Data

With Analytical reporting, you are not limited to the machine data being fed into QH FLUIDTREND™, but data can also be combined from other, third-party sources to provide more meaningful data or analysis based on your company's individual requirements or business' KPIs. Data can be fed from over 120 different sources including: Access, Excel, Google Analytics, JSON, MySQL Databases, and more.

A combination of QH FLUIDTREND™ data and one or more of the 120 different datasets can answer bespoke questions such as "Which machines are having issues relating to a Google Analytics keyword that is currently bringing high traffic to your website?".

Analytical reports can give your business a pre-emptive strike to keep you ahead of the competition instead of being reactive to what's already happened.
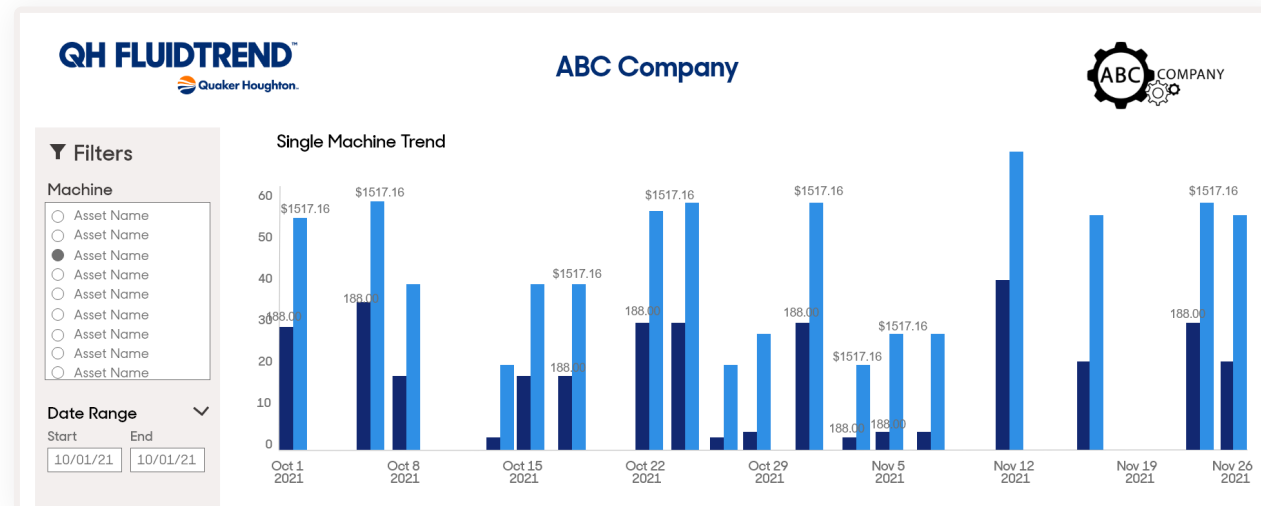
Internet of Things (IOT).

Real-time Sensor Data

Using internet enabled sensors, QH FLUIDCONTROL™ and QH FLUIDMONITOR™ are able to send real-time data results to QH FLUIDTREND™ to highlight individual machine issues to Customers and Technicians for resolution.

Utilising the real-time information from QH FLUIDCONTROL™ and QH FLUIDMONITOR™, Technicians will be able to provide the best solutions for industry segments, workflows, and individual machines.

This will answer questions like "Why does machine X work more efficiently than machine Y when the configuration is the same?", or "What measures can we introduce to keep this machine operational until it's next scheduled service in order to prevent costly downtime?"

Improve Productivity

With IoT sensors monitoring data in real-time, Technicians won't be wasting their allocated time performing tests on an undetermined number of machines that require no further action.

Instead, they can concentrate on reactive actions to resolve any issues highlighted to them only on the machines that need them. Then, when any issues have been resolved, they can start looking into preventative maintenance measures that will keep machines running more efficiently, for longer, further moving your processes and productivity higher, all whilst reducing maintenance costs and downtime.

Features & Benefits

- See issues as and when they happen
- See fluctuating issues that may otherwise be missed
- Save time by reducing manual testing
- More efficient maintenance

Features & Benefits

- Consistent reporting – QH FLUIDTREND™ can now provide a single style of reports irrespective of region, improving data accessibility for the customer.

- Customer has the opportunity to self serve data from the portal.

- Effective auditing – historical data can be used to recognize and resolve issues making preventative maintenance easier to identify.

- Multilingual laboratories can translate reports from different languages.

Globally Unified Laboratories

QH FLUIDTREND™ has globally unified our laboratories, enabling us to deliver continuous improvements and take care of your fluid investment by identifying abnormalities in the trends. With specialists in each of our sites, you are connecting with an expansive resource of expertise.

Reports can be pulled in a few clicks and analysed from a global perspective, and with all our regional laboratories working consistently we are able to improve our best practises to deliver a more efficient service to our customers.

Laboratory.

Fluid Sample Analysis

We have twenty Fluid Analysis laboratories globally, and sites in each continent covering all industries. Samples sent to the laboratories for in depth analysis are processed using QR coding, enabling them to be accurately identified.

Our scientists conduct a range of tests, both for standard regular condition checks and other assessments that cannot be completed by technicians on site. Reports are then returned to the QH FLUIDTREND™ portal, streamlining the process into a paperless and fully digitized workflow.

Tests are conducted using industry standard methods depending on the region and our scientists recognise where your fluid can be improved, diagnosing potential issues and implementing maintenance programs to prevent machine downtime and extend fluid and equipment life.

Information from testing can be shared with our Research and Development (R&D) laboratories, working together with our Fluid Analysis teams to achieve a circle of continuous improvement:

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