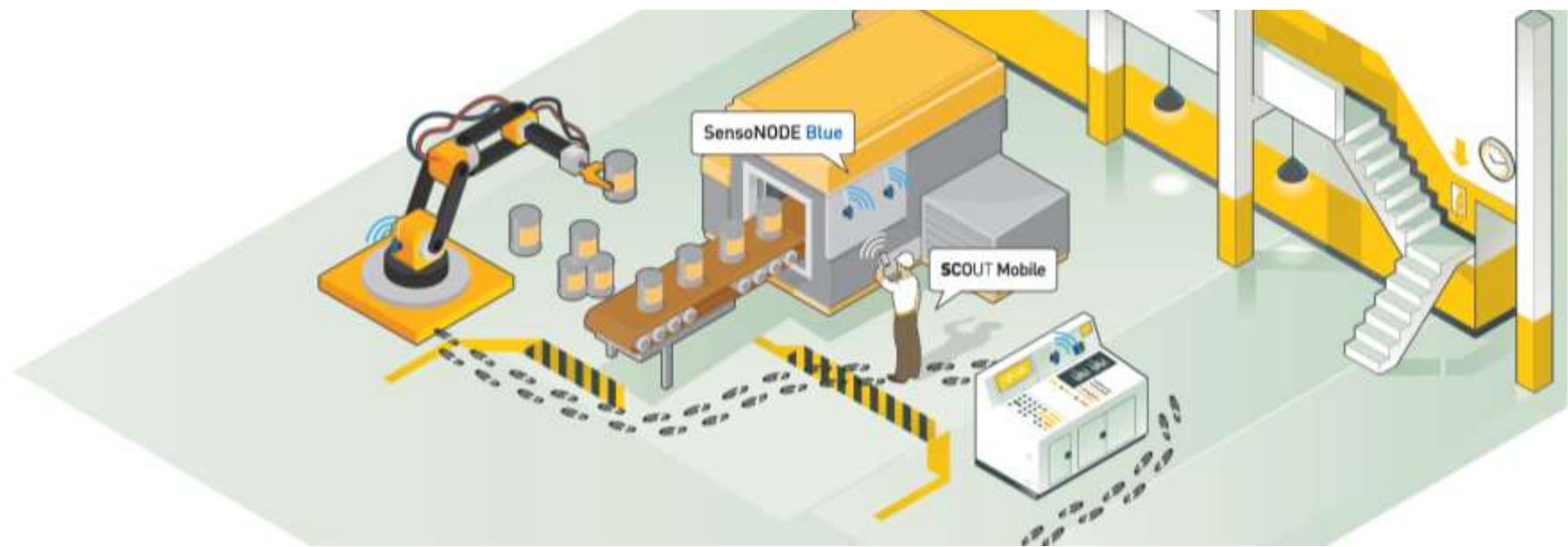# Condition Monitoring & Diagnostics Solutions

SensoNODE
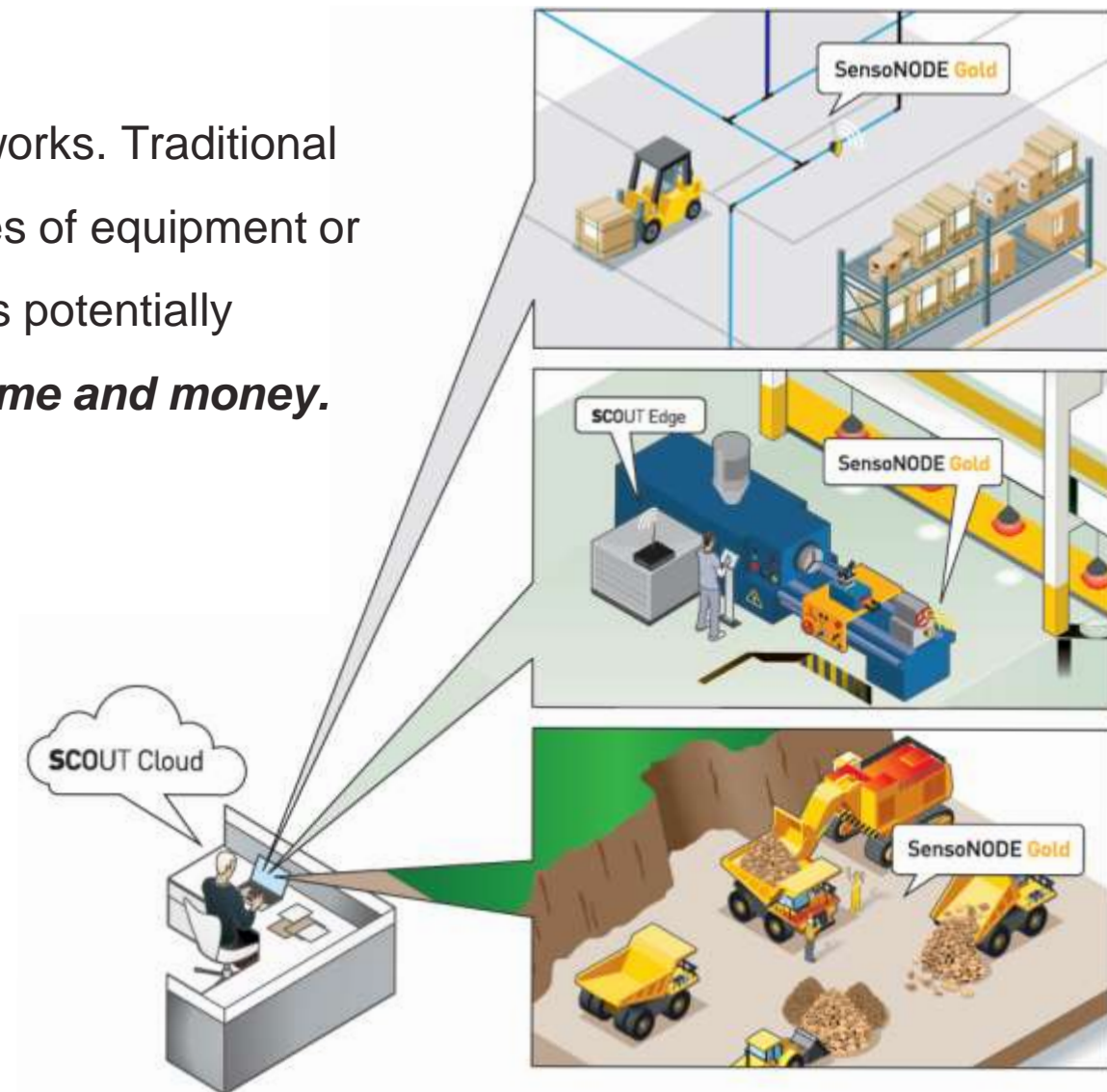*Sensors & Scout Software*

Contents

- IoT-empowered products solutions

- Voice of the Machine solutions

- Streamline Your Work With Advanced Condition Monitoring and Diagnostics

- Route-Based Monitoring & Diagnostics

- **SensoNODE™ Blue**

- **SensoControl™**

- **SCOUT™ Mobile / Mobile App**

- Continuous Remote Monitoring

- **SensoNODE™ Gold Sensors, SCOUT™ Cloud, and SCOUT™ Edge**

IoT-Empowered Solutions

The Internet of Things (IoT) has changed the way manufacturing works. Traditional condition monitoring means taking measurements on certain pieces of equipment or processes one at a time, it is a labor-intensive process and creates potentially dangerous situations for workers…in short; *it costs companies time and money.*

Incorporating IoT-enabled solutions into your operations ensures your company is moving forward.

Parker's SCOUT™ Software and SensoNODE™ Sensors are IoT-empowered solutions that create new, advanced condition monitoring possibilities to reduce downtime and decrease maintenance costs, helping you to maintain production and improve efficiency.
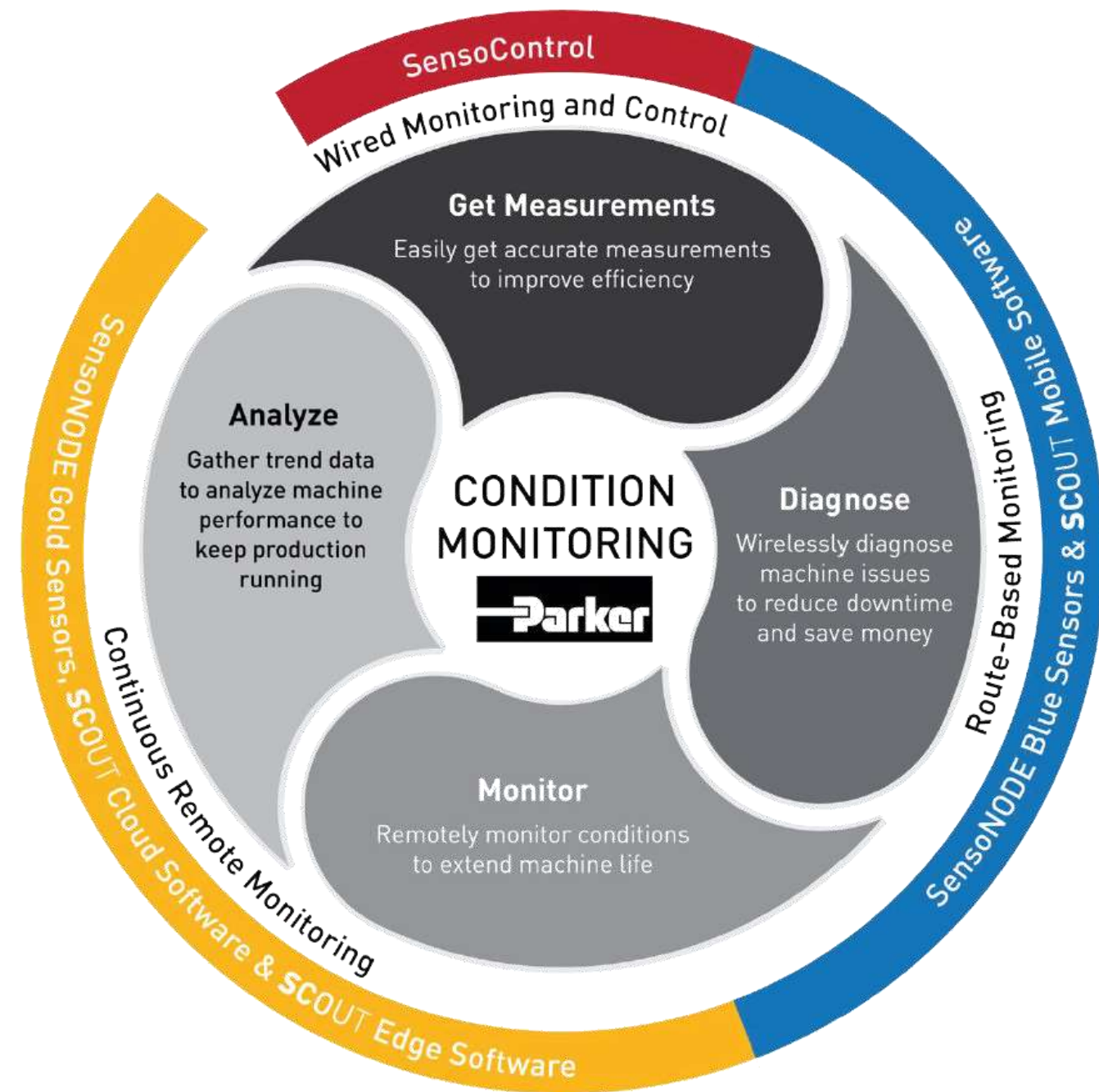
VOICE OF THE MACHINE™

- Voice of the Machine is a centralized strategy to ensure standardization across all Parker IoT-empowered products.

- Voice of the Machine solutions assure you of component-level IoT that is interoperable, secure, scalable and easy-to-use.

- Parker's advanced condition monitoring solutions listen to the Voice of the Machine, allowing you to:

    - Reduce your risk, maintenance costs, and unplanned downtime

    - Uncover operational and performance improvements

    - Make informed, more confident decisions and enjoy greater peace of mind

    - Leverage Parker's expertise to employ easy, cost-effective condition monitoring

Streamline Your Work With Advanced Condition Monitoring and Diagnostics

Advanced condition monitoring wirelessly get measurements without interrupting production.

• Identify issues before they escalate

• Reduce downtime

• Decrease maintenance costs

When used together, **SC**OUT Software and SensoNODE Sensors create an advanced condition monitoring solution that delivers vital measurement data to help drive optimal tactical, operational, and strategic decisions, leading to maximum uptime.

Streamline Your Work With Advanced Condition Monitoring and Diagnostics

Route-Based Monitoring - No network required

(SCOUT **Mobile and SensoNODE Blue)**

• Short-term monitoring when you need it

• Aids diagnostic efforts

• Take measurements from individual machines

• Wireless solution for on-site monitoring

• Export recorded measurements

• Avoid dangerous situations

• Make better, more informed decisions

• Improve labor efficiency

Continuous Remote Monitoring – Network-based

(SCOUT **Cloud/Edge and SensoNODE Gold)**

• Long-term and immediate health of machines and processes are viewable around the globe

• Ideal for environments where assets are mission critical, and shutdowns are costly

• User selectable measurement data storage

• Remote solution accessible anywhere, anytime

• Get notified automatically of discrepancies

Route-Based Monitoring & Diagnostics

Parker's **SC**OUT Mobile Software and SensoNODE Blue Sensors deliver an IoT solution where hardware and software work together to provide measurements and diagnostics across multiple applications and industries.

Ideal for quick, accurate diagnostics, **SC**OUT Mobile and SensoNODE Blue help companies:

- Get accurate measurements

- Gather measurements from a distance without interrupting production

- Avoid potentially dangerous situations

- Diagnose issues quickly

- Improve work efficiency

- Share data direct from your mobile device

Route-based monitoring and diagnostics allow workers to take instant measurements of individual assets wirelessly, and record those measurements using their mobile device.

SensoNODE™ Blue Sensors and SCOUT™ Mobile Software

SensoNODE Blue is Parker's series of Bluetooth-enabled sensors. Compact, energy-efficient, and wireless, they are designed to provide simple and useful solutions for diagnostic and condition monitoring applications with mobile devices. SensoNODE monitors asset measurements to help predict problems and prevent downtime.

Why Blue?

• Accurate measurements

• Easy installation

• No network required

• Wireless installation removes challenges of wired systems

• No external power source required

• Ultra-low battery consumption for up to five years of battery life*

• Sealed sensor housing ideal for harsh environments

• Compact lightweight design

• LED indicators aid in identifying sensor status

* Not continuous use

SCOUT **Mobile** allows users to receive measurements direct to their mobile devices. **SC**OUT Mobile compiles the data and presents it in a way that makes sense to a user's operation, allowing them to track data immediately, and receive user-defined alarms for unplanned condition changes that may damage assets. Mapping and dashboard functions allow you to customize data visualization.

Why SCOUT **Mobile?**

• Measurements delivered to your mobile device

• Easy-to-use interface

• Customizable dashboards

• Mapping function

• Set your own alarm thresholds of measurements (min/max)

• Alerted when outside of defined thresholds

• Name sensors so they are easily identifiable

• Easy-to-understand trend charts

• Multiple users can access data from their mobile device

• Export data for analysis, sharing, and retention

SensoNODE™ Blue

Pressure

Features:

- Available in a variety of pressure ranges from -14.5 psi to 8700 psi.

- User-definable measurement units (psi/bar) for convenient and familiar data readings.

- Port options: Male NPT or SAE thread and EMA or PD quick couplers for fast and easy connecting.

- Corrosion resistant materials for challenging

- environments.

- Sensor also provides ambient temperature values.

- User selectable measurement and broadcast intervals. Refer to **SC**OUT Mobile for more information about capabilities and modalities.

Temperature

Features:

- User-definable measurement units (F°/C°) for convenient and familiar data readings

- Port Options: Male NPTF and SAE

- Corrosion-resistant materials for challenging environments.

- User-selectable measurement and broadcast intervals. Refer to **SC**OUT Mobile for more information about capabilities and modalities.

- Available in unique foot and clamp designs for quick attachment to pipe or hard tubing.

Humidity

Features:

- 0-100% relative humidity.

- Ideal for ambient condition and inert compressed gas monitoring applications.

- NPTF port to make plumbing and connecting easier and faster.

- Optimal mounting orientation is vertical with port facing down to prevent moisture collection.

- Sensor also provides ambient temperature values.

- User-selectable measurement and broadcast intervals. Refer to the **SC**OUT Mobile App for more information about capabilities and modalities.

SensoNODE™ Blue

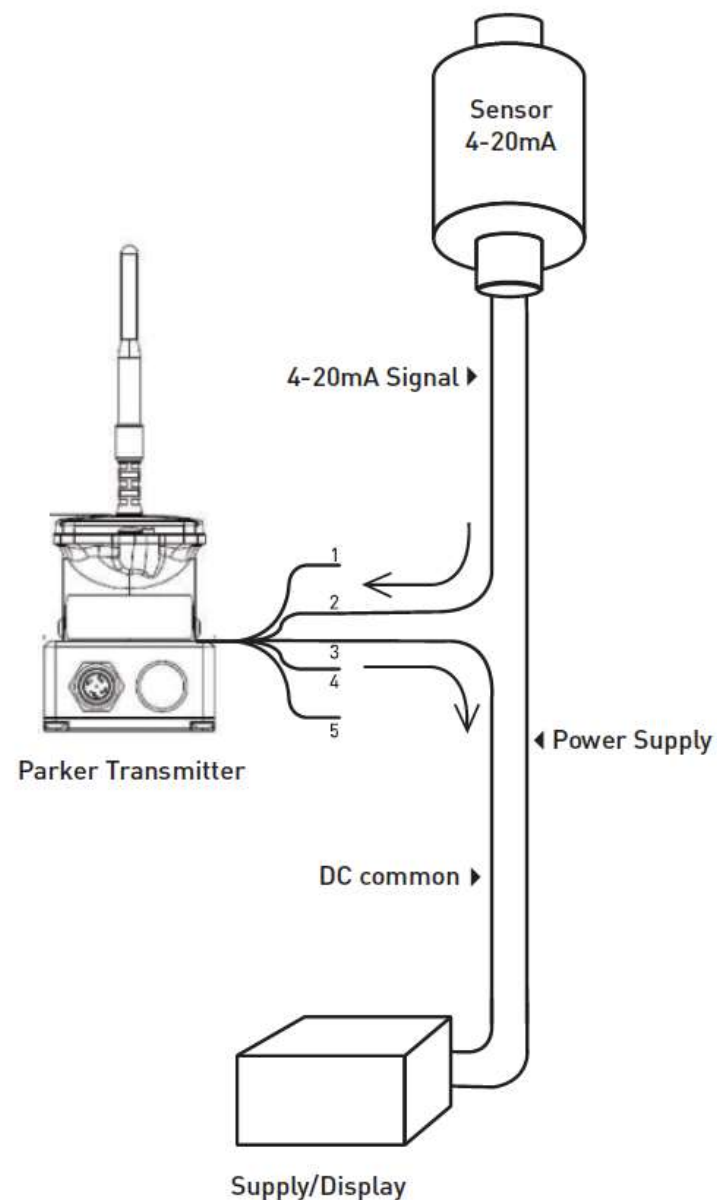## Flexible Displacement

Features:

- Magnetic base for tool free mounting.

- Threaded stud port provides alternative mounting option where magnetic base is not suitable.

- Soft, thin and conformable sensors.

- Reliable accurate measurements while being strained up to 100% for millions of cycles.

- Resilient silicone rubber that can withstand harsh environments.

SensoNODE™ **Blue**

Sensor
4-20mA

4-20mA Signal ▶

Parker Transmitter

◀ Power Supply

DC common ▶

Supply/Display

4-20mA Transmitter

Features:

- Connects inline with any 4-20mA Sensor.

- Transmits wired sensor output into **SC**OUT Mobile App, including alarms and trend data.

- Magnetic base for tool free mounting.

- Threaded stud port provides alternative mounting options where magnetic base is not suitable.

- Definable mapping feature in **SC**OUT Mobile App to present 4-20mA signal in user defined units.

- Requires connection cable SCK-400-xx-xx in conjunction with transmitter and 4-20mA Sensor.

SensoControl™

ServiceJunior™ CONNECT

Features:

- Wireless operation, remote readings

- Easy operation

- Digital pressure monitoring

- Scalable and expandable

- Fluid temperature: -4F to 176F

- Certifications: FCC, IC, CE*

- Hand-held digital pressure gauge • Measure and Display Pressure • Backlit display • User-adjustable pressure units • Min/Max memory • Battery life indicator • Ranges for hydraulics and pneumatics • Scanning rate of 10ms

SCOUT™ Mobile / Mobile App

SCOUT Mobile is used for *diagnostics and condition monitoring for predictive maintenance*. The app allows users to connect to Parker's SensoNODE™ Blue wireless sensors to gather measurements for a wide range of fluid and gas applications.

SCOUT Mobile puts vital information in the palm of the user's hand. It offers *immediate and historic trend information* collected by SensoNODE™ Blue wireless sensors and presents it in a way that makes sense to a user's operation, providing the information needed to optimize asset performance. Data can also be easily exported and shared.

SCOUT Mobile alerts users to unplanned condition changes that may damage components and equipment. As levels rise above or fall below *user-defined thresholds*, users are alerted to these events, giving them an opportunity to address potential issues that could harm the system over time, helping to *reduce unplanned downtime and increase productivity*.

SCOUT™ Mobile / Mobile App

Capabilities:

- Mobile application designed for iOS and Android
- Connect and display SensoNODE Blue Sensors

Features:

- Intuitive design and user experience
- Auto recognition enables users to quickly add and connect multiple sensors concurrently
- Easy readability of measurements with visualized data in digital gauges and trend charts
- View immediate measurements that include current values and minimum/maximum indicators in addition to historical sensor information
- Configurable alarm thresholds with alerts when thresholds are exceeded; monitoring continues while sensors are unattended
- Customizable trend charts and dashboards
- Mapping function for pressure, 4-20mA and flexible displacement sensors that correlates raw measurements into your "specific" units
- Easily export and share data
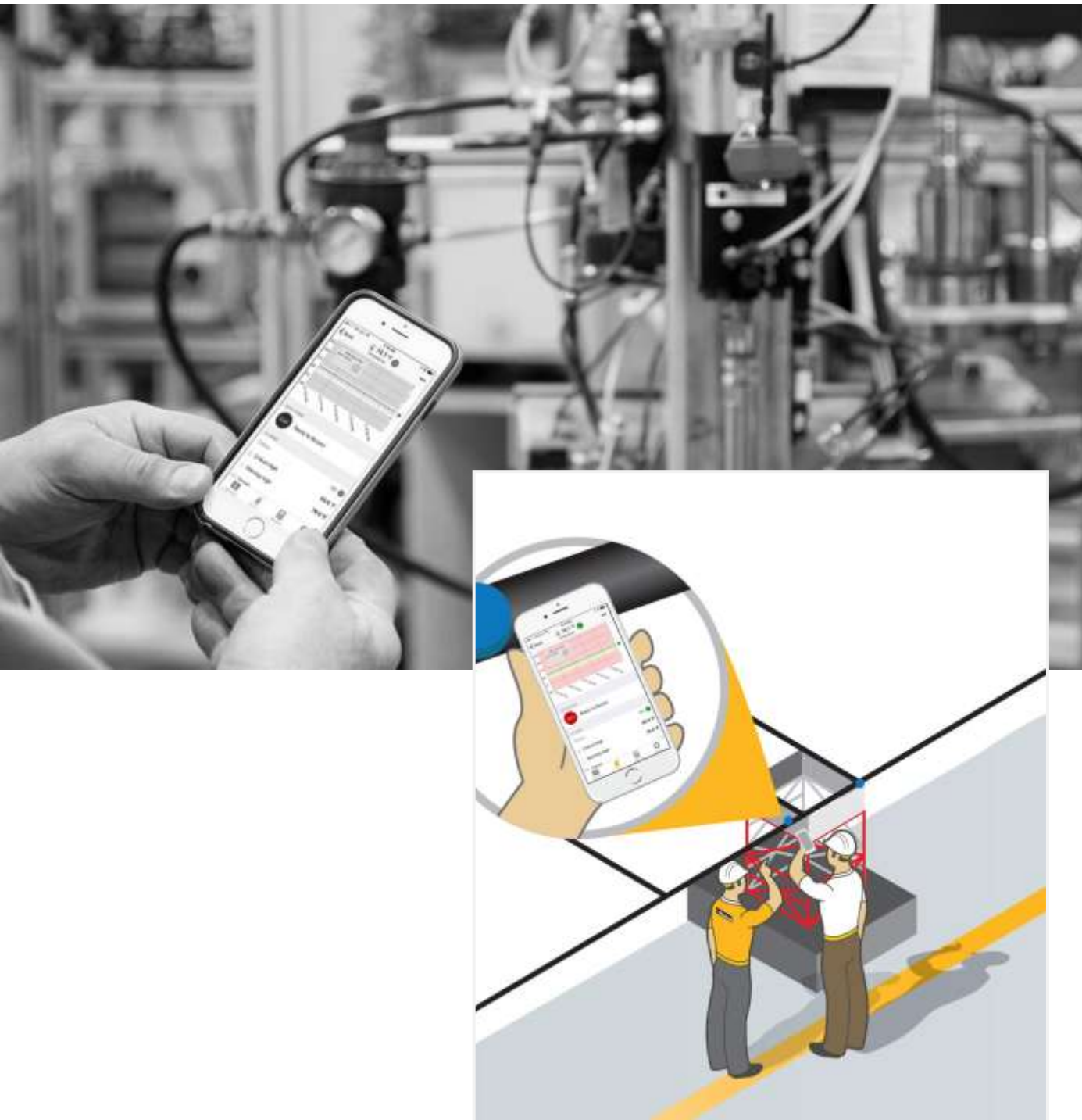
SCOUT™ Mobile

Mobile App

Compatibility:

• Requires iOS 9 or newer/Android 4.4 or newer

Languages:

• English

Supported Devices:

• iPhone (4S and newer)

• iPod Touch (5th Gen and newer)

• iPad 3, 4

• iPad Air and iPad Air 2

• iPad Mini (1st Gen and newer)

• iPad Pro

• Compatible with most Bluetooth Low Energy (BLE) supported Android devices

SCOUT™ Mobile / Mobile App
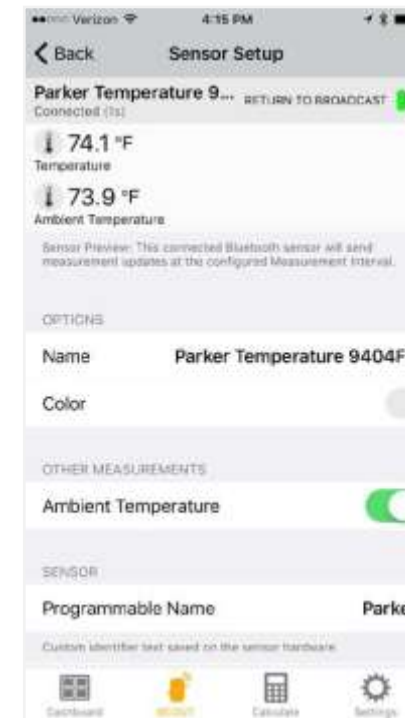
Sensor Inventory

One touch access to sensors that have been added to your mobile device with their latest measurements, alarm status, and sensor mode - broadcasting or connected
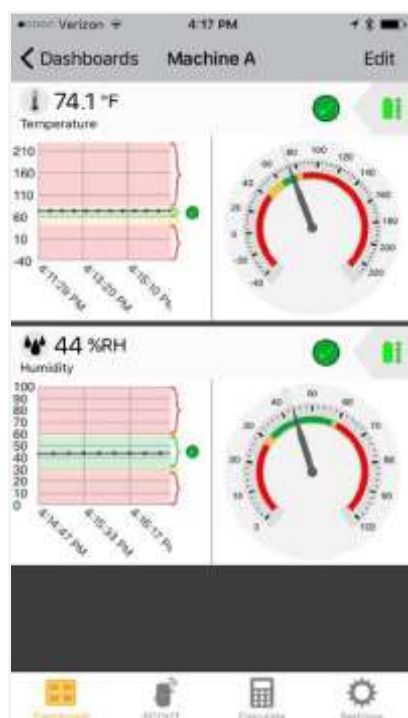
Measurement Detail

Focus on a single measurement with trend charts, digital gauge, alarm thresholds and other useful features for the operational professional.

Sensor Setup

Configure sensors with individually programmed name, highlight color and modes of operation to suit different use cases.
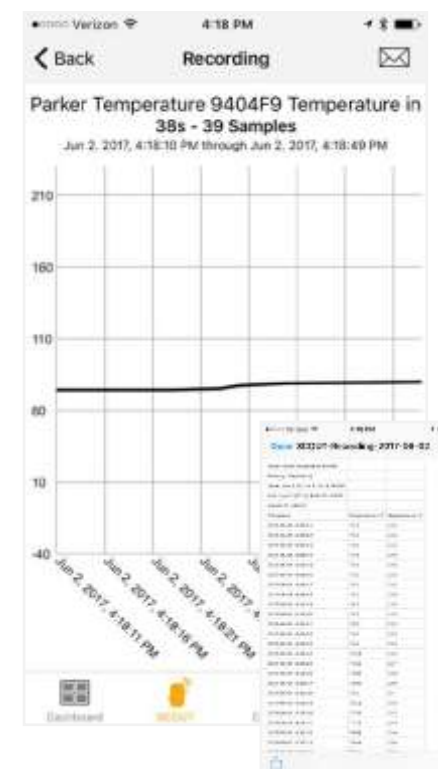
Dashboard

Simplify monitoring activities by grouping measurements that belong together and compare the group's trends and gauges.

Alarm Settings

Define measurement thresholds to get notified of important changes. Critical thresholds are programmed to sensor firmware for exception monitoring between readings.

Record & Export

Record and export measurements in CSV format for sharing with peers or further analyzing in other applications (e.g. Excel).

Continuous Remote Monitoring

- For more long-term condition monitoring applications, continuous remote monitoring allows you to track measurements to gauge the health of your machines and processes.

- Whether you're at your desk or out visiting a customer, you can monitor and collect data from multiple assets and get alerts of deviations.

- This is ideal for large-scale operations with production and assembly lines.

Parker's **SCOUT Cloud Software** and **SensoNODE** Gold Sensors deliver a complete, standalone solution that isn't dependent on a facility network or IT department. All you need is an internet connection and browser to monitor your asset measurements from anywhere.
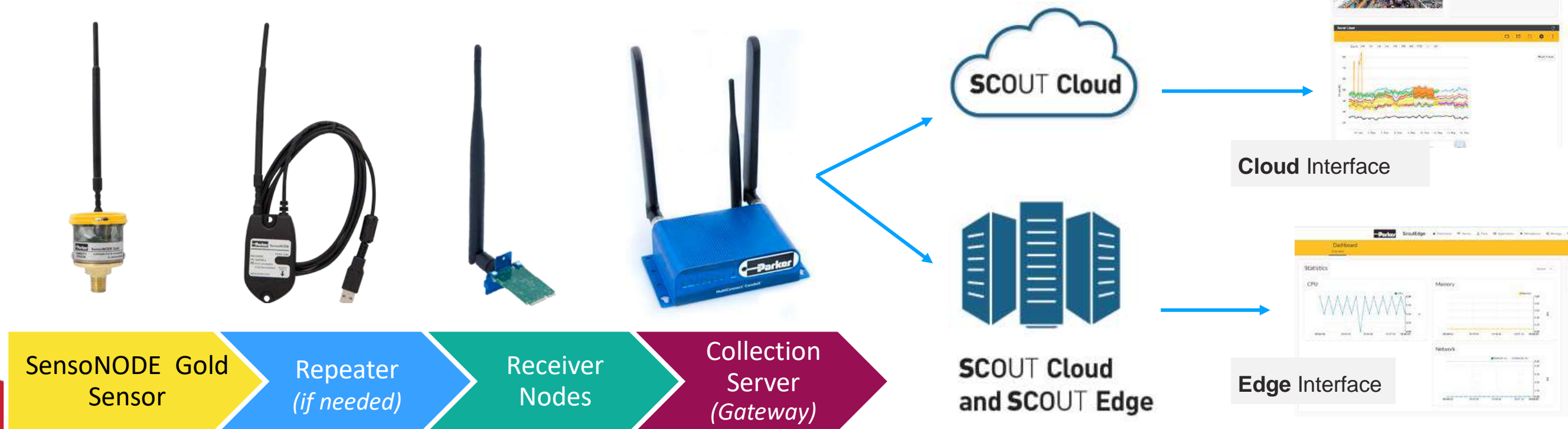
Continuous Remote Monitoring

SCOUT **Cloud/Edge and**

SensoNODE Gold

With quick and simple data gathering from multiple facilities, users can:

• Review data anywhere, anytime and make better decisions

• Improve safety

• Get measurements without interrupting production

• Monitor more assets and processes with fewer staff

• Optimize machine performance and service life

• Maintain production quality

• Immediate notification of deviations/ exceptions

• Analyze performance trends for indications of pending failures

Data Stream

SensoNODE Gold Sensor	Repeater *(if needed)*	Receiver Nodes	Collection Server *(Gateway)*

SCOUT Cloud

Cloud Interface

SCOUT Cloud and SCOUT Edge

Edge Interface

SensoNODE™ Gold Sensors, SCOUT™ Cloud, and SCOUT™ Edge

SensoNODE Gold is Parker's series of networked, wireless sensors that are developed for continuous condition monitoring via the cloud or local enterprise applications. That means as long as you have an internet connection, you can get up-to-date measurements.

Why Gold?
- Wireless sensors that are small in size
- Simple sensor installation
- Provides accurate measurements
- Place sensors at point of need
- Longer battery life
- Longer range radio
- Durable construction for harsh environments – IP65 rated

SCOUT Cloud is Parker's cloud-based continuous condition monitoring interface that provides alerts, status, and analytics for increased awareness of your processes and assets.

Why SCOUT Cloud?
- Access to data anytime, anywhere
- Easy to use web-based interface
- No software download – no updates
- Receive alert notifications - email, text message, or in-system
- Visualize data in a way that makes most sense
- Customize alerts, trend charts, and dashboards
- View measurement anomalies easily
- Support continuous improvement efforts with trend data
- Multiple user access levels
- Remotely monitor multiple sites and sensors
- Export data

SCOUT Edge is Parker's gateway software which enables sensor network connectivity to local enterprise application.

Why Edge?
- User defined and determined
- Presents measurements to customer-managed network system
- Control collection of sensor data
- Easy to use web-based interface for configuration and management
- Data security
- Native support for numerous industrial data standards
- Integration of customer sensors
- Export and share data
- Visual programming for integration

Parker

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Pressure

Features:

- Available in a variety of pressure ranges from -14.5 psi to 8700 psi.

- User-definable measurement units (psi/bar) for convenient and familiar data readings.

- Port options: Male NPT or SAE thread and EMA or PD quick couplers for fast and easy connecting.

- Corrosion resistant materials for challenging environments.

- Sensor also provides ambient temperature values.

- Configurable measurement and broadcast intervals*. Refer to **SC**OUT Cloud for more information about capabilities and modalities

Temperature

Features:

- User-definable measurement units (F°/C°) for convenient and familiar data readings.

- Port Options: Male NPTF and SAE

- Corrosion-resistant materials for challenging environments.

- Configurable measurement and broadcast intervals*. Refer to **SC**OUT Cloud for more information about capabilities and modalities.

- Available in unique foot design for quick attachment to pipe or hard tubing.

Humidity

Features:

- 0-100% relative humidity.

- Ideal for ambient condition and inert compressed gas monitoring applications.

- NPTF port to make plumbing and connecting easier and faster.

- Optimal mounting orientation is vertical with port facing down to prevent moisture collection.

- Sensor also provides temperature values.

- Configurable measurement and broadcast intervals*. Refer to the **SC**OUT Cloud for more information about capabilities and modalities.

Current

Features:

- Fast installation over a variety of power lead diameters.

- Easy installation with 1/2" conduit threaded nipple mount.

- Standard CT opening width is 1.25" for 50A through 600A service.

- CT with 0.75" opening width is available for 50A through 200A service by request.

- Configurable measurement and broadcast intervals*. Refer to the **SC**OUT Cloud for more information about capabilities and modalities.

SensoNODE™ Gold

Flexible Displacement

Features:

- Magnetic base for tool free mounting.

- Threaded stud port provides alternative mounting option where magnetic base is not suitable.

- Soft, thin and conformable sensors.

- Reliable accurate measurements while being strained up to 100% for millions of cycles.

- Resilient silicone rubber that can withstand harsh environments.

SCOUT Cloud is used for continuous remote monitoring for long-term condition monitoring applications.

The web-based interface allows users to remotely retrieve data.

SensoNODE Gold Sensors integrated into assets or production lines collect the data and send it to the on-site collection server, which pushes the data to the cloud.

Users access that data by logging into **SC**OUT Cloud via their desktop anywhere they have an internet connection.

SCOUT Cloud lets users monitor and collect data from multiple assets and receive alerts of deviations.

With increased awareness of processes and assets, users don't have to be on-site to review data to

optimize machine performance, extend service life, maintain production quality and reduce downtime.

SCOUT™ Cloud Software

Capabilities:

• Monitor multiple assets in multiple facilities anywhere, anytime

• Connect with and display SensoNODE Gold Sensors

Features:

• Easy to use web-based interface

• No software to download or update

• Receive alert notifications via email, text, or in-system

• Visualize data in a way that makes most sense

• Customize alerts, trend charts, and dashboards

• View measurement anomalies easily

• Support continuous improvement efforts with trend data

• Multiple user access levels

• Remotely monitor multiple sites and sensors

• Easily export data

FPE FLUID POWER ENGINEERING SOLUTIONS

SCOUT™ Cloud Software

Site View Enlarged

The enlarged Site View displays measurement type, alarm indicators, and live measurements for each sensor. Easy identification of assets within your facility.

SMS Alert

Home Dashboard Alerts

The Alerts tab of the Home Dashboard displays every alert assigned at a sensor, asset, or group level. The alert's settings are quickly identified.

Email Alert

Site Group Dashboard

The Group level dashboard displays live measurements, historical trend chart, and identifying image of your selected assets organized within a grouping

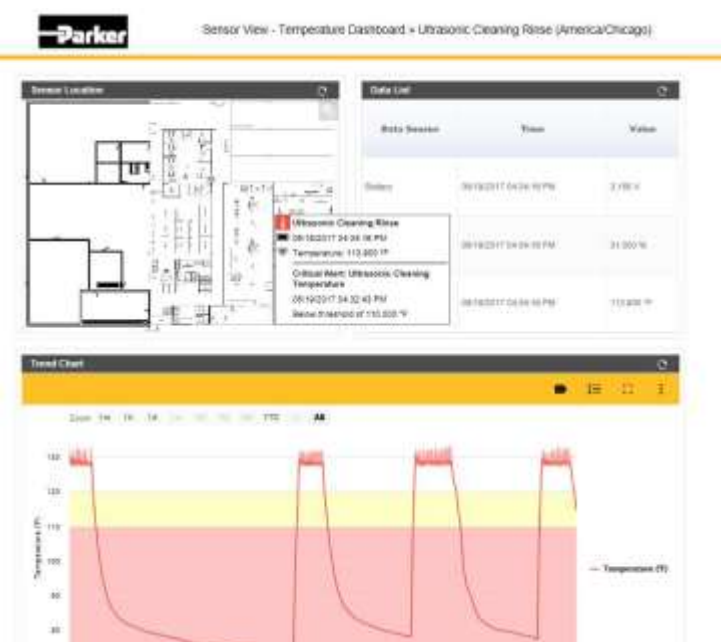FPE FLUID POWER ENGINEERING SOLUTIONS

SCOUT™ Cloud Software

Site View Trend Chart

The Trend Chart displays historical measurement data, alarm bands, and measurement trends. The displayed data can be downloaded in CSV format.

Asset Dashboard

The Asset level dashboard displays live measurements, historical trend chart, and identifying image of your selected sensors attached to a specific asset.

Site View with Callout

Hovering over the live sensor measurement in the identifying image displays a callout. The callout provides additional information for the individual sensor.

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Condition Monitoring Solutions

	SensoControl	SCOUT Mobile and SensoNODE Blue	SCOUT Edge and SensoNODE Gold	SCOUT Cloud and SensoNODE Gold
Primary Application				
Wireless Continuous Remote Monitoring			√	√
Wireless Route-Based Monitoring		√		
Diagnostics	√	√		
Communication Method				
900 MHz Wireless			√	√
Bluetooth Low Energy (BLE)		√		
Wires	√			
Key Features				
Alert Notifications - Text, Email, In-System			√	√
In-Use Alarms		√	√	√
Export and Share Data	√	√	√	√
Recordings	√	√	√	√
View Historical Data			√	√
Configurable Dashboards		√		
Functions or Calculations	√	√		
Configurable Units of Measure	√	√	√	√
Multiple Visualizations	√	√		
Viewable on Multiple Devices		√*	√	√
Add Sensors Instantly	√	√	√	
Fastest Measurement Rate	1 millisecond**	1 second	750 milliseconds	20 seconds
Pressure Spike and Drop Capturing	√			
Synchronization of Measurement Inputs	√			
Battery Life	Use Dependent	Rate Dependent	Rate Dependent	Rate Dependent
FCC, IC, &/or CE Certified	√	√	√	√
IP Rating	IP67/IP64/IP65***	IP65	IP65	IP65
Data Storage				
Cloud				√
Local Server			√	
Mobile Device		√		
Handheld Meter	√			
Interface				
Desktop/Laptop	√		√	√
Mobile App		√		
Handheld Meter	√			
Other				
Software License			√	
Optional Cellular Subscription				√
Internet/WiFi/LAN Required			√	√
Collection Server Required			√	√
Site Survey Required			√	√

*In Broadcast Mode Only   **0.1ms Available on ServiceMaster+   ***Varies with Handmeters

FPE FLUID POWER ENGINEERING SOLUTIONS

Let's explore how condition monitoring & diagnostics solutions can deliver real time control for decision making and maximising operational efficiencies