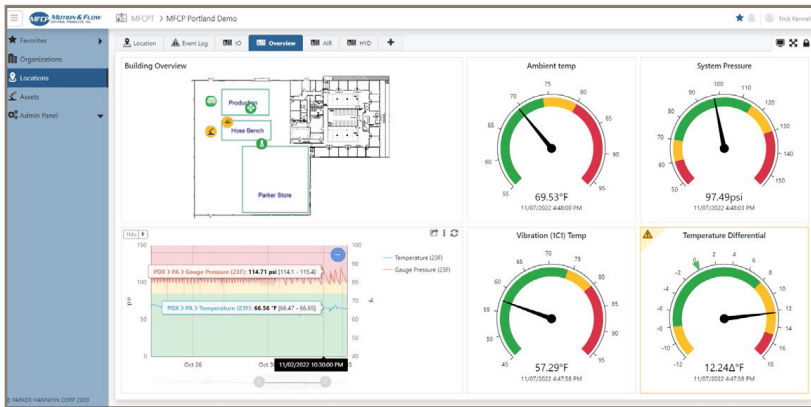
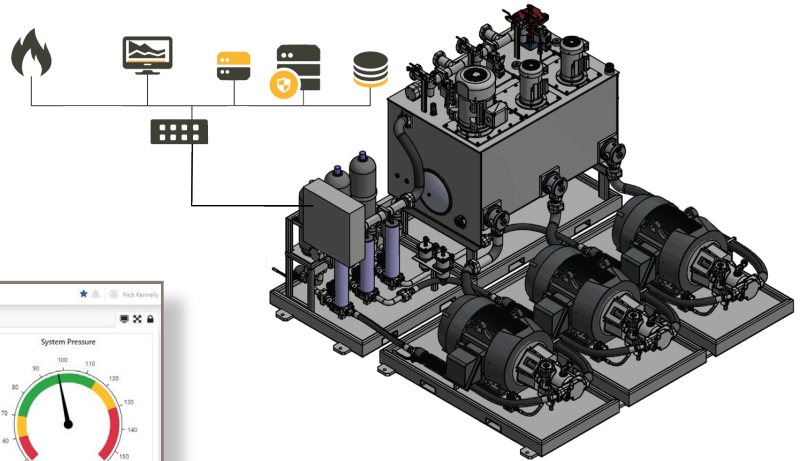


# Pulse

## Remote Condition Monitoring Solution

**VOICE OF THE MACHINE**  
*IoT Empowered*



# IIoT Introduction

*Industry 4.0 technologies will reduce the cost of manufacturing with the help of automation, systems integration, and data management.*

## ENHANCED MACHINE MONITORING PROVIDES:

- Less downtime
- Faster changeovers
- Predictive machine maintenance scheduling
- Overall Equipment Effectiveness (OEE) data

## KEY DRIVERS REDUCING THE COST OF MANUFACTURING INCLUDE:

- Faster production
- Reduced machine and production line downtime
- Improved product quality
- Waste reduction
- Lower operating costs

## AUTOMATES THE COMPLIANCE PROCESS:

- Quality inspections
- Track and trace
- Automated reporting
- Data logging

## SMART FACTORY TECHNOLOGIES:

- Factory communication
- Remote monitoring
- Predictive maintenance
- Smart sensors
- Tank level monitoring

# IIoT Benefits



## MONEY

Notification before failure can allow for repair before a catastrophic failure turns expensive components to scrap. Equipment status information can provide for predictive maintenance as opposed to preventative maintenance. Lowering overall cost due to efficient servicing and reduced down time.



## SAFETY

Loud, hot, confined spaces and pinch points are common in the industrial world. Remote monitoring can keep your employees away from these areas. Better Maintained equipment is also safer equipment to work around.



## SECURITY

Reduce the risk of lost maintenance records by utilizing the cloud and get the proper personnel notified when events occur. Encrypted and secure channels for communication ensure IT risks are minimized.



## TIME

Reduce downtime by getting alerts before failures. Eliminate service routes and trips to equipment until service is actually needed. Get equipment info instantly instead of waiting for log sheets. Reduce the time required to commission or troubleshoot equipment.



## CONTROL

Give your equipment the ability to do exactly what is needed and have the ability to control your equipment and monitor status from anywhere. The ability to adapt or make changes from anywhere allows more flexibility in your processes.

# Remote Condition Monitoring

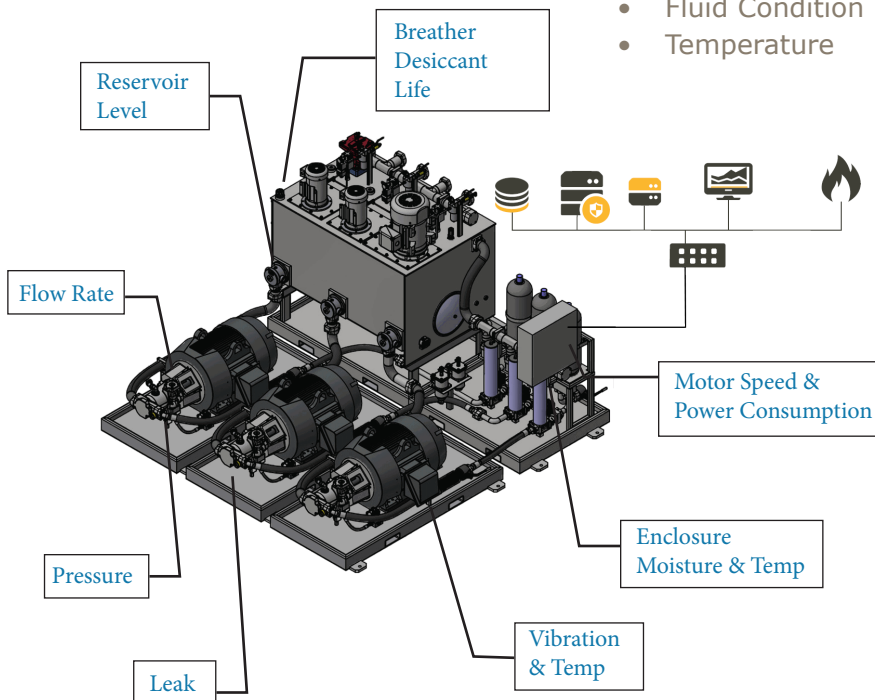
## Solution Examples

### Hydraulic Power Unit

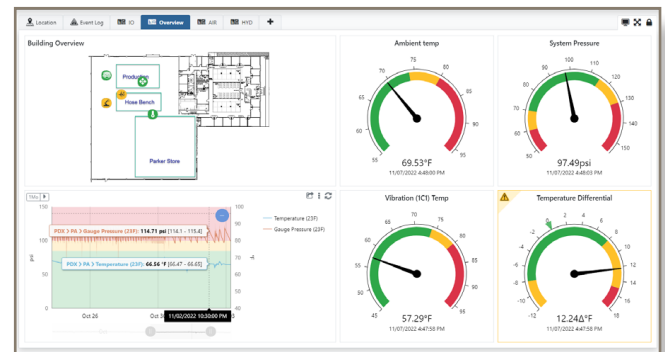
#### Monitoring Capabilities

- Motor & Pump Health
- Motor Speed
- Motor Power Consumption
- Filter Element Condition
- Fluid Condition
- Temperature

- System Pressure
- Reservoir Level
- Desiccant Condition
- Control Panel Climate
- Power Monitoring
- Flow Rates



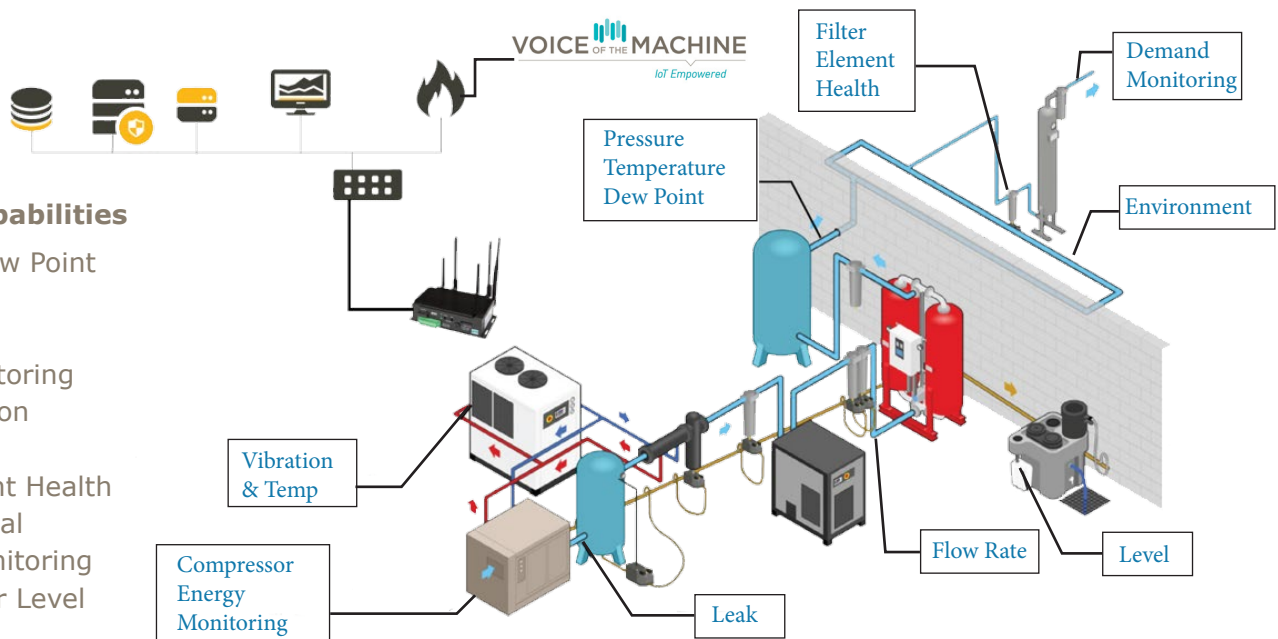
VOICE OF THE MACHINE  
IoT Empowered



### Compressed Air System

#### Monitoring Capabilities

- Humidity/Dew Point
- Pressure
- Temperature
- Energy Monitoring
- Leak Detection
- Flow
- Filter Element Health
- Environmental
- Demand Monitoring
- Oil Separator Level



# Voice of the Machine Dashboards

## Tiered Dashboard Layers:

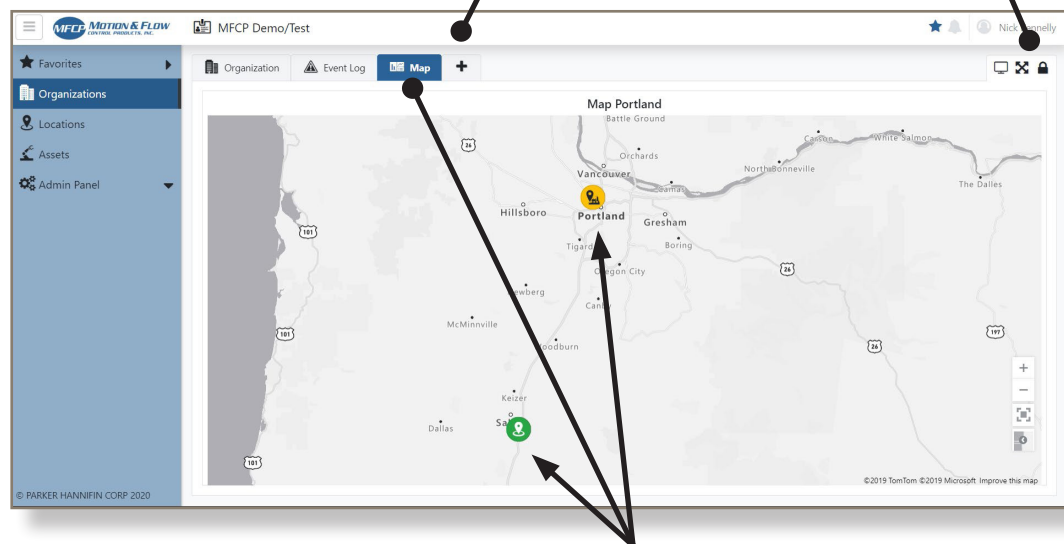
- Organization
- Locations
- Assets

### + Add a Dashboard

Multiple templates and widgets available

### Dashboard Controls

Kiosk mode, full screen and configurations unlock



## Organization Map Dashboard

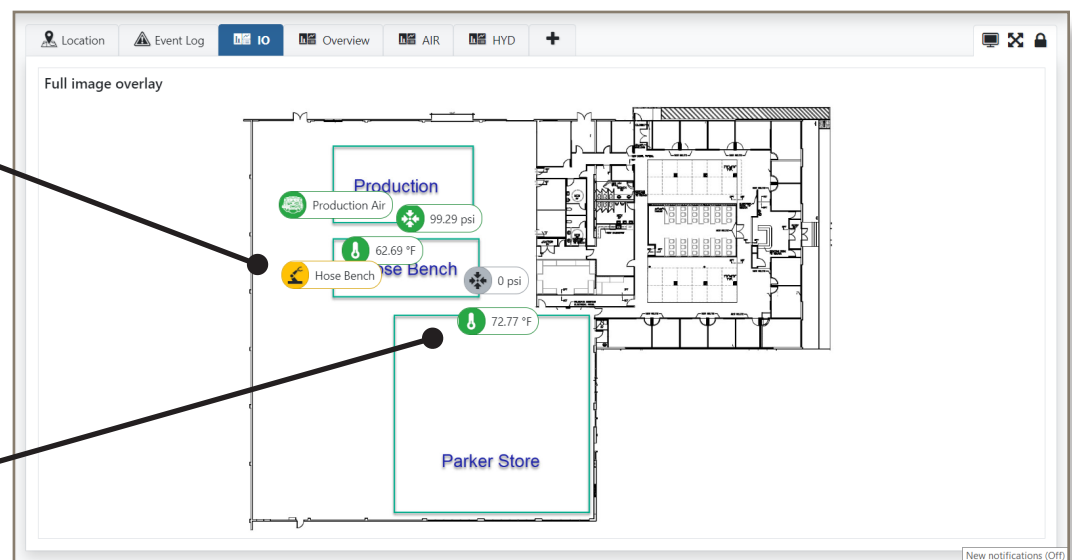
*Provides Quick Status View of All Locations*

## Asset Status

Rollup of thresholds set at asset level

## Location Signals

Individual sensor signals set a location level



## Location Image Overlay Dashboard



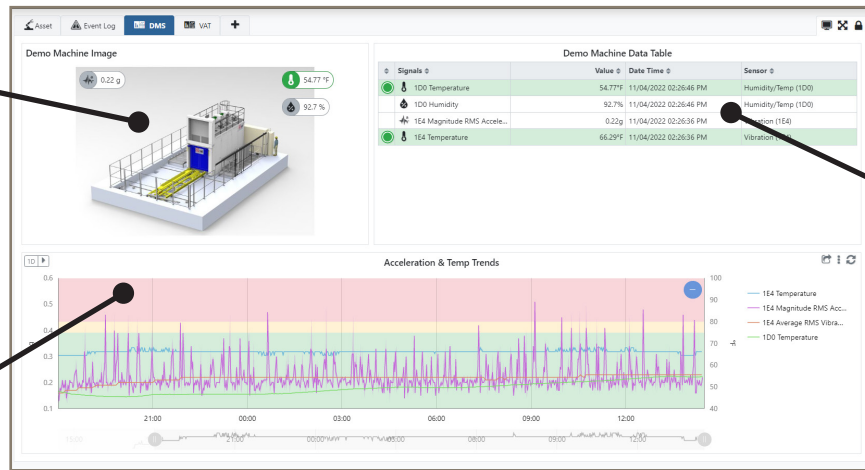
# Voice of the Machine Dashboards

## Image Overlay

Display dashboard related image with signal values and alert status

## Trend Chart

Trending history of multiple signals viewed against threshold settings

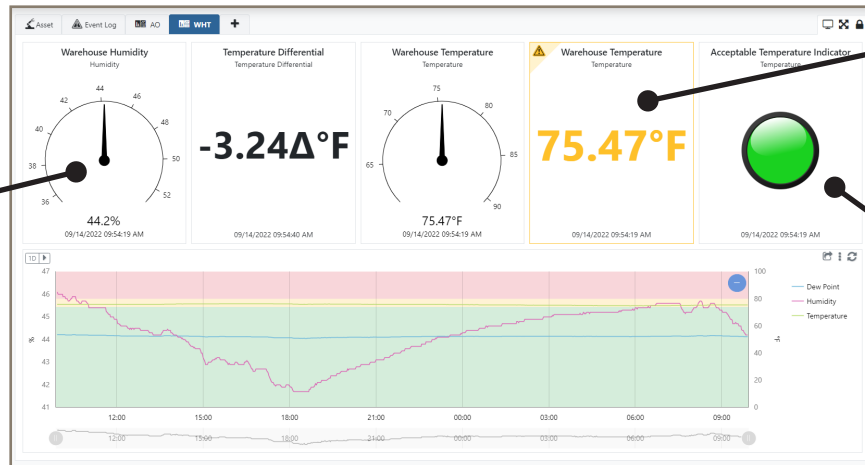


## Data Table

View all signal values and alert status

## Dial Gauge Widget

Latest signal level against configurable gauge range and thresholds



## Big Number Widget

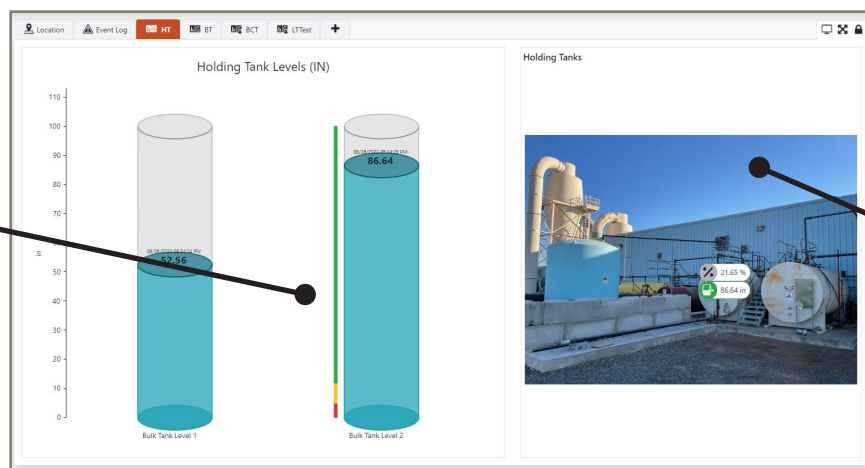
Latest actual value and Alerts

## State Indicator

Alarm state of critical signal

## Tank Level Indicator

Visual representation of tank levels thresholds to indicate level alerts and alarms



## Image Overlay

Display actual image of the tanks being monitored

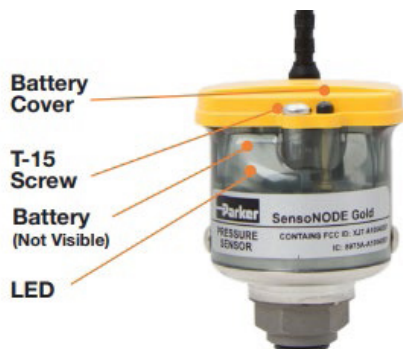
# Remote Condition Monitoring

Sensors

Data  
Transmission

Data Storage

Data Interface/  
Monitoring



## Starter Kit Includes:

- 1 Parker Voice of the Machine gateway
- 5 SensoNODE sensors
- 1 year of access to Parker's Voice of the Machine Cloud IIoT platform
- 1 year of MFCP's Pulse support service
  - Training
  - System & Dashboard setup
  - Ongoing Support

**Additional Sensors available based upon application needs, but not included in starter kit...**



## Sensors



### SensoNODE™ Gold Sensors

## Data Transmission



Gateway

## SensoNODE Gold Gateway

The gateway receives data from any SensoNODE Gold Sensor and most third-party wired sensors (via a SensoNODE Gold Analog Transmitter) and transmits to Parkers Voice of the Machine Cloud IIoT platform.



### Repeater

- Primary use as network repeater [range extender] for all sensors joined to gateway receiver
- Each repeater can support up to 250 signals
- Robust over molded design for harsh environments



### SensoNODE Pressure Sensors

- Available in a variety of pressure ranges from -14.5 psi to 8700 psi
- Thread options: Male NPT or SAE thread and EMA 16x2 or PD quick couplers for fast and easy connecting
- Sensor also provides ambient temperature values



### SensoNODE Temperature Sensors

- User-definable measurement units (°F/°C) for convenient and familiar data readings
- Thread Options: Male NPT and SAE
- Available in unique foot design for quick attachment to pipe or hard tubing



## Data Storage

## Data Interface/ Monitoring



Cloud Server



VOICE OF THE MACHINE Cloud



### SensoNODE Humidity Sensors

- 0-100% relative humidity
- Ideal for ambient condition and inert compressed gas monitoring applications
- NPT thread to make plumbing and connecting easier and faster
- Sensor also provides temperature values



### SensoNODE Vibration Sensors

- Configurable acceleration amplitude (+/- 2g, 4g, 8g or 16g)
- 3 axis measurements (X, Y, Z)
- Magnetic base and 1/4-28 UNF thread for ease of mounting
- Sensor also provides temperature value
- RMS & Peak acceleration or velocity



### SensoNODE Analog Transmitters

- Connects inline with any 4-20mA, 0-10VDC or 0-24VDC Sensor
- Magnetic and 1/4-28 UNF X 0.45" mounting base threads
- Wirelessly integrates hard-wired sensors into the Voice of the Machine Cloud



### SensoNODE Current Sensors

- Fast installation over a variety of power lead diameters
- Current Sensors Ranging from 10A up to 600A
- Easy installation with 1/2" conduit threaded nipple mount

# Remote Condition Monitoring

## Starter Kit

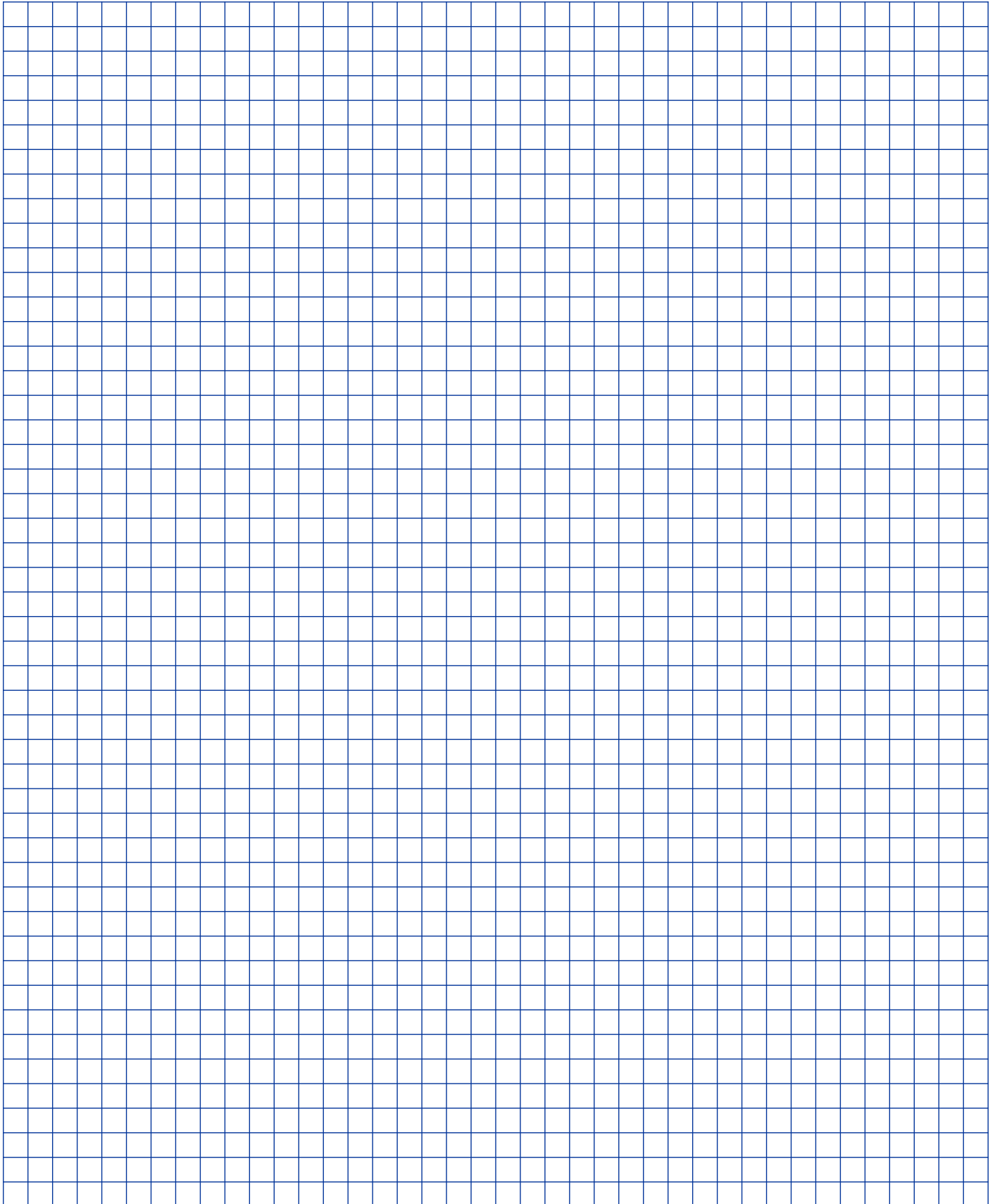


### How to Order:

- Pick 1 Gateway depending on application location (Verizon or AT&T)
- 1 Repeater Included
- Pick 5 SensoNODE Gold Sensors or transmitters from below
- Submit your selections below or any other IoT requests to [IoT@mfcplnc.com](mailto:IoT@mfcplnc.com)

	Part No.	Description
Gateway	<b>SN-CS-10-A</b>	VotM Cloud / Edge Gateway w/ 900Mhz Recvr (AT&T LTE)
	<b>SN-CS-10-V</b>	VotM Cloud / Edge Gateway w/ 900Mhz Recvr (VZW LTE)
Repeater	✓ <b>SNREN-2</b>	Range Extender/Repeater Node (900Mhz)
Pressure Sensors	<b>SNPT2-100-2-4MO</b>	0-1500psi Presssure Sensor (-4 SAE)
	<b>SNPT2-10-2-4MP</b>	0-150psi Pressure Sensor (1/4 NPT)
	<b>SNPT2-1-2-4MP</b>	-14.5 to 14.5psi Vacuum Sensor (1/4 NPT)
	<b>SNPT2-250-2-4MO</b>	0-3625psi Pressure Sensor (-4 SAE)
	<b>SNPT2-400-2-4MO</b>	0-5800psi Pressure Sensor (-4 SAE)
	<b>SNPT2-600-2-4MO</b>	0-8700psi Pressure Sensor (-4 SAE)
Temperature Sensors	<b>SNT2-0-2-FT</b>	Temperature Foot
	<b>SNT2-700-2-4MO</b>	Temp Sensor 0.40" Probe (-4 SAE)
	<b>SNT2-700-2-4MO-0335</b>	Temp Sensor 3.35" Probe (-4 SAE)
	<b>SNT2-700-2-4MP</b>	Temp Sensor 0.40" Probe (1/4 NPT)
	<b>SNT2-700-2-4MP-0335</b>	Temp Sensor 3.35" Probe (1/4 NPT)
Humidity Sensors	<b>SNHT2-10-2-4MP</b>	Humidity Sensor (1/4 NPT)
	<b>SNHT2-10-2-4MP-SMA</b>	Humidity Sesnor (1/4 NPT, SMA)
Vibration	<b>SNVT2-1632-2</b>	Vibration Sensor (tri-axial, 16G, 6.4KHz)
Current Sensors	<b>SNC2-050-2</b>	Current Sensor (10-50 Amps)
	<b>SNC2-100-2</b>	Current Sensor (20-100 Amps)
	<b>SNC2-200-2</b>	Current Sensor (40-200 Amps)
	<b>SNC2-300-2</b>	Current Sensor (60-300 Amps)
	<b>SNC2-400-2</b>	Current Sensor (80-400 Amps)
	<b>SNC2-600-2</b>	Current Sensor (120-600 Amps)
Analog Transmitters	<b>SN420-2</b>	Analog Transmitter (4-20mA)
	<b>SNDV2-2</b>	Voltage Transmitter (0-10VDC; 0-24VDC)

# Notes





## Products

Actuators, Stages & Cylinders  
Automation Components  
Compressed Air Equipment  
Controls  
Drives & Motors  
Electrical

Filtration  
Gauges & Measurement  
Hose, Tubing & Fittings  
Hydraulics  
Machine Safety  
Mobile & Truck

Pneumatics  
O-Rings & Seals  
Sensors & Switches  
Tools & Assembly  
Vacuum  
Valves

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## Services

Seal Kitting Services  
Hose Kitting Services  
Cylinder Interchanges  
Hydraulic Component Repair  
Tube Bending and Fabrication

Rental Units/Equipment  
Vendor Managed Inventory

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## Engineered Solutions

Control Systems & Enclosures  
Standard Hydraulic Power  
Units  
Custom Hydraulic Power  
Units

Custom Hydraulic Manifolds  
Pneumatic Systems &  
Assemblies  
Seal Engineering  
System Installation

System Design  
Schematics  
Custom Machine Guarding  
Workstations & Workcells

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## Technologies

Automation  
Compressed Air & Pneumatics  
Controls/Control Panel  
Electromechanical  
Filtration

Hose, Tubing & Fittings  
Hydraulics  
Mobile Controls &  
Hydraulics  
Machine Safety

Seals & Engineered  
Materials  
Industrial Hose

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## Locations

We support our customers in the Western United States with a growing number of locations. When you visit one of our ParkerStores, you can count on quick, friendly service from one of our store professionals.

All of our ParkerStores stock products provide hose assemblies while you wait, adapters, and many Parker fluid connector products. Individual stores offer additional products and services to support the industries in their specific locations.