The background of the page is a grayscale image. On the left side, there are several server racks filled with electronic components. On the right side, there is an industrial machine, possibly a pharmaceutical production line, with various pipes, tanks, and a conveyor belt carrying small bottles. The text is overlaid on this background.

# Remote Monitoring & Control Solutions

**IIoT/Industry 4.0**

# 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

## 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 costs.



SAFETY

## 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

## 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

## 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.



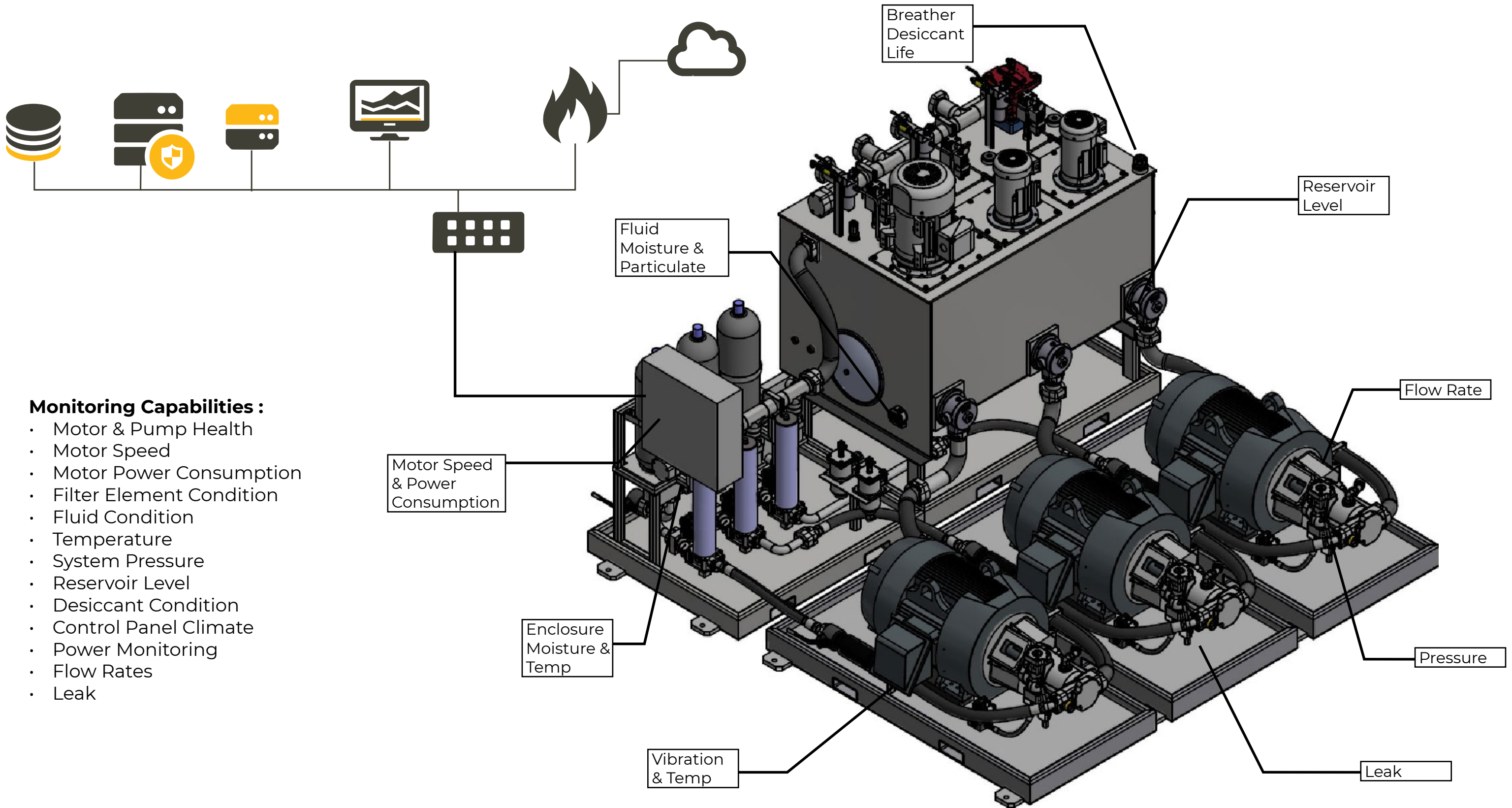
CONTROL

## 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.

# IIOT EXAMPLE

# HYDRAULIC POWER UNIT

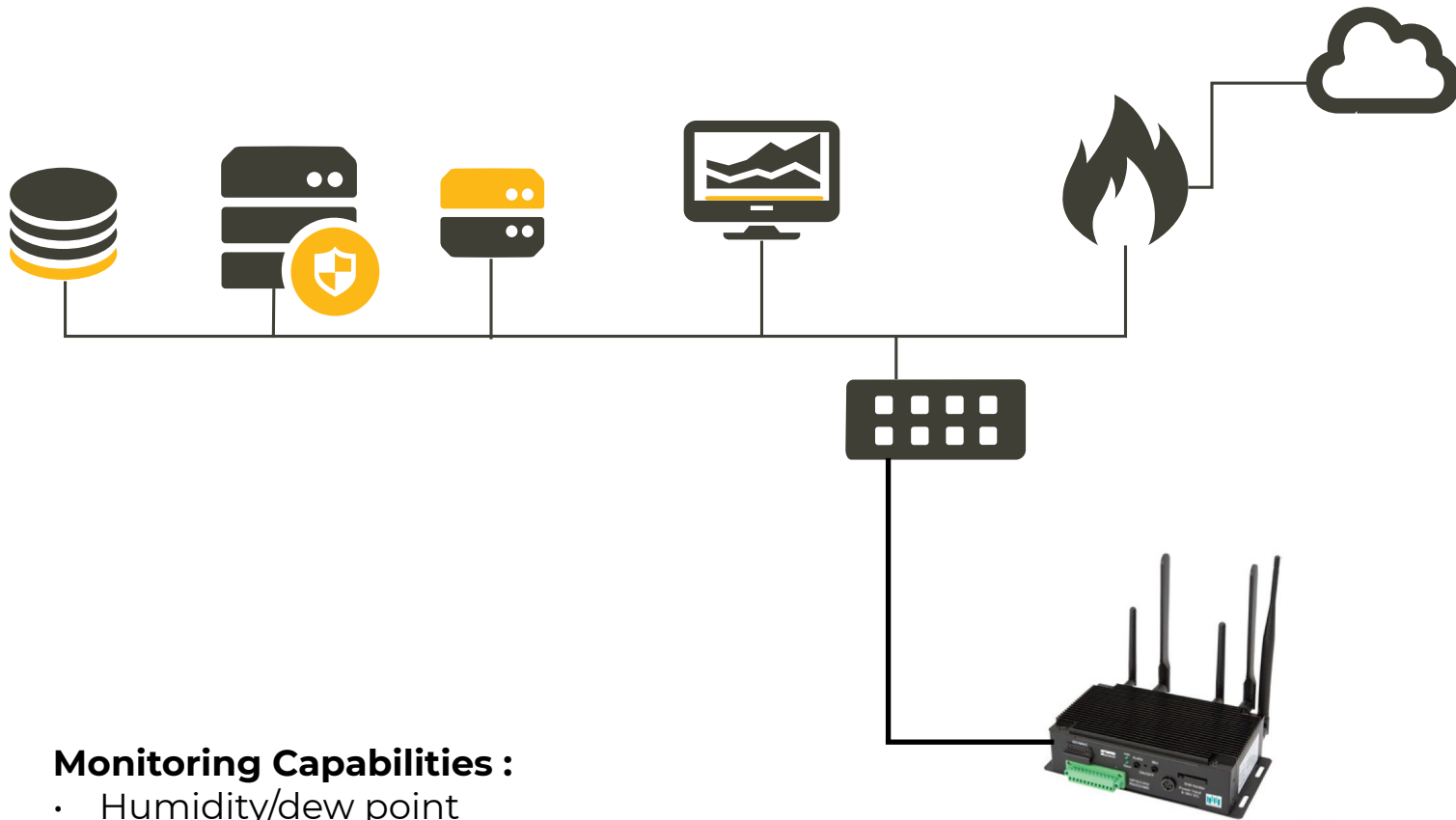


### Monitoring Capabilities :

- 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
- Leak



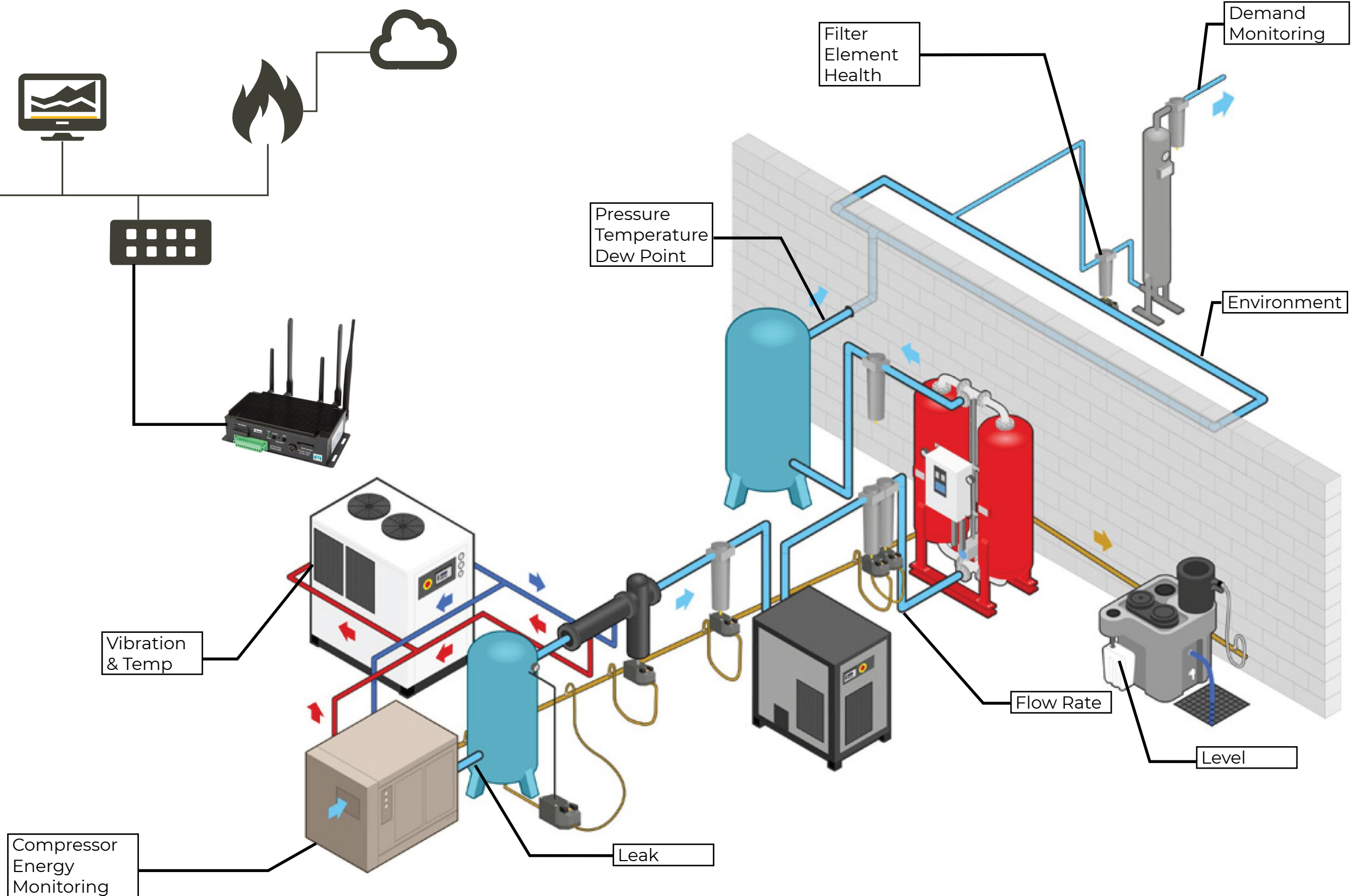
# IIOT EXAMPLE



## Monitoring Capabilities :

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

# COMPRESSED AIR SYSTEM



# MONITORING ONLY



Monitoring only for visualizing critical equipment and environmental conditions.



Allows visibility of equipment status to detect problems before they occur eliminating expensive downtime



No security concerns since system is not networked



Summary of status can reduce maintenance routes to hard to reach or distant locations.



Can eliminate trips to hot, loud or confined spaces.



Simple project scope can be implemented quickly and with less cost.

## Basic Level:

Stocked solutions kits for monitoring:

- Motor Temp & Vibration
- Environment Temperature & Humidity
- Tank Level Monitoring
- System and Point-of-use Pressure

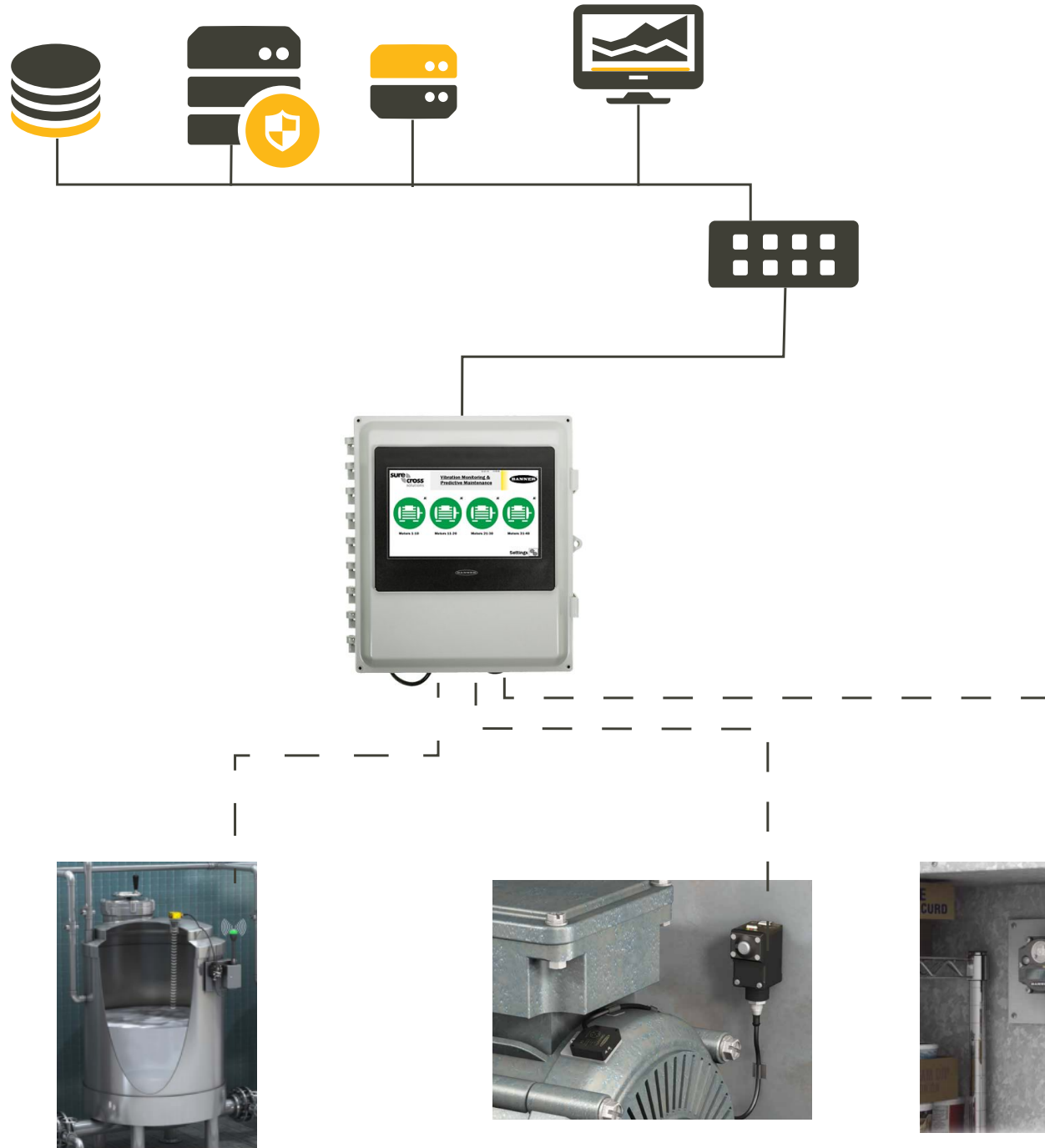
Ready to be expanded to multiple sensors to measure multiple tanks or a entire motor room without long conduit runs. Measure pressure at key points throughout the facility to help detect leaks and prematurely clogged filters.

## Customizable:

- Mix sensor types
- Mix wireless sensors with wired sensors
- Display on local HMI or push to large Andon screens
- Push to wireless indicator or stack tower lights

Based on stocked kits, customizable options can be quickly developed without the cost and delays of large engineering efforts. Start small and built out of time taking advantage of ease of implementing new wireless sensors and feedback devices.

# MONITORING+



# LOCAL ACCESS

Monitoring + Local Access gives the previous benefits plus long term tracking of data, monitoring of trends, etc for critical equipment and environmental conditions. Can also enable monitoring from the office environment.



Reduced security risk given system is only on local network



Provide visibility to office in addition to factory floor



Basic data push and notification functionality built-in to reduce time to implement solution



Take advantage of existing network infrastructure to provide access to information without additional costs



Flexibility allows integration into existing SCADA systems or 3rd party software for fast implementation

## Basic Level:

Stocked solutions include:

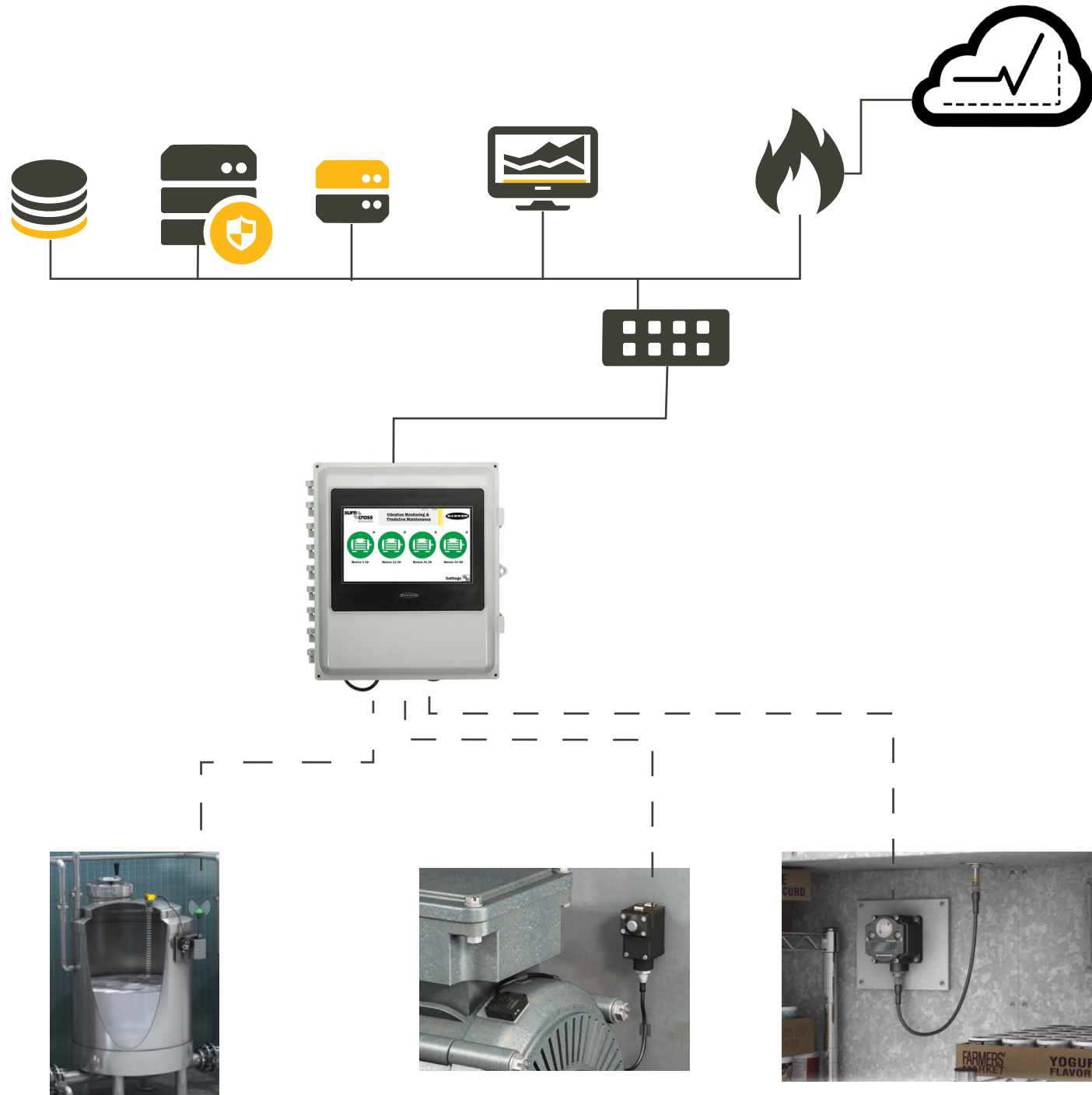
- Trigger email alerts to local mail server
- Push data to local IP via HTTPS
- API for polling data from SCADA or 3rd party software

## Customizable:

- Store directly to databases such as SQL, MySQL, etc
- Advanced email messaging to include parameters, etc
- Host webpage for viewing status on facility Wifi/Network






Based on stocked kits, customizable options can be quickly developed without the cost and delays of large engineering efforts. Start small and built out of time taking advantage of ease of implementing new wireless sensors and feedback devices.

# MONITORING+



# CLOUD ACCESS

Monitoring + Local Access + Cloud Access provides all the previous benefits plus the ability to access data from anywhere, take advantage of 3rd party analytical cloud services like AI prediction and provide more options for notification.

-  Connection via HTTPS, SSH or other secure means ensures no ports are opened in your network
-  Change settings, confirm options and monitor from anywhere internet access is available, even your phone
-  Visibility and control of remote sites can increase safety by avoiding hazardous areas and unnecessary travel
-  Existing cloud services eliminate the need to develop, maintain and implement these services from scratch
-  Prevent time spent retrieving lost data or requesting data be shared between remote sites

## Basic Level:

Stocked solutions include:

- Trigger email alerts to remote mail server
- Data storage to cloud systems
- Push data to any 3rd party external IP address

## Customizable:

- Connect to Microsoft Azure or Amazon AWS
- Host webpage for viewing status from anywhere

Based on stocked kits, customizable options can be quickly developed without the cost and delays of large engineering efforts. Start small and built out of time taking advantage of ease of implementing new wireless sensors and feedback devices.



# IIoT OVERVIEW

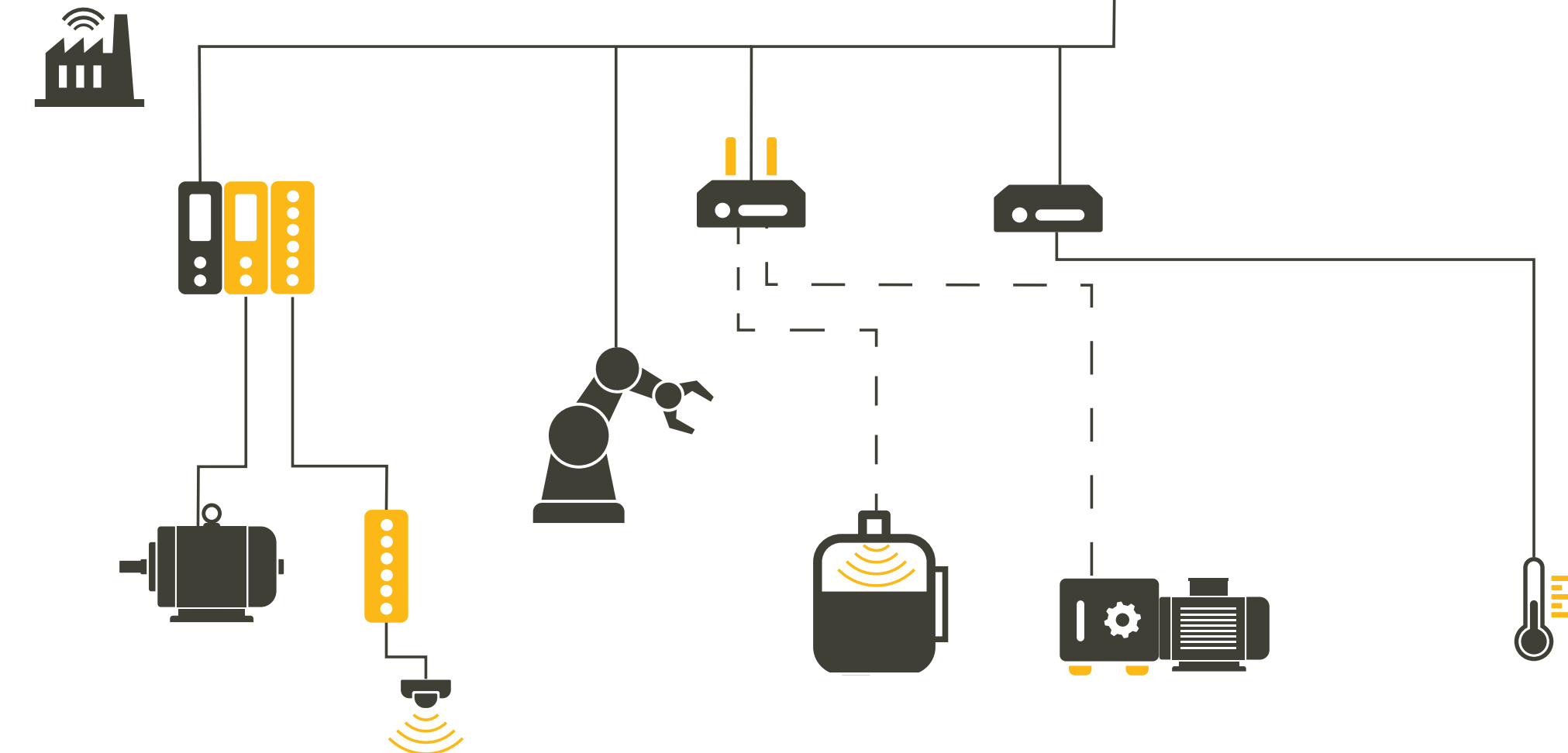
## IT INFORMATION TECHNOLOGY





**Data Consumption & Storage**  
Office & Server Room Level - Servers, Switches, Database, BI, Firewall

**REST API HTTPS://**  **AMQP**  
Advanced Message Queuing Protocol

## OT OPERATIONAL TECHNOLOGY



**Data Communication**  
Control Cabinet Level - Gateways & Controls

 **MQTT**.ORG  **OPC UA**

**Data Generation & Notification**  
Device Level - Sensors, Motors, Tanks Monitoring

 **EtherCAT**  **EtherNet/IP**  
 **IO-Link**  **Modbus**



# SMART SENSORS



## Wireless Sensors

### Parker - Sononode Gold

- Wide range of sensors: temperature, pressure, humidity, flow, level, vibration
- Long battery life
- Sensing in media and environment



## Connected Breather

### Des-Case - DC Series

- Shorten scheduled lube routes by collecting data
- Decrease injuries by monitoring breathers in remote or confined areas
- View status and trends from anywhere
- Bluetooth or ModbusRTU variants



## Hydraulic Fluid Quality

### Parker - iCountPD

- Inline measurement of particles to ISO4406 /NAS1638 + moisture saturation
- Data via analog (0-5V/4-20mA), RS232 or CANbus J1939
- Industrial, mobile and hazardous/explosive variants

# SMART SENSORS



## Wireless Sensor Node

### Banner - Q45 Series

- Motor/Pump Vibration & Temperature, Environmental Temperature & Humidity, and 1-wire serial sensors available
- Reduce installation time and cost for sensing project



## Temperature Sensor

### Turck - TS Series

- Local Display and value output
- Sensors Diagnostics built-in
- Programming and feedback via IO-Link



## Pressure Sensor

### Turck - PS+ Series

- Protection up to IP6K9K
- Up to 600bar
- Rotatable sensor head for convenient mounting
- Switching outputs, analog outputs and programming and feedback via IO-Link

# SMART SENSORS



## Level Sensor Banner - UCL510

- 49" range, continuous level feedback
- Analog output + 4 SPST relays, control + monitor
- Compatible with corrosive liquid



## Flow Sensor Turck - FTCI Series

- Thermal Flow meter, calorimetric, magnetic-inductive and vortex style available
- Inline or Insertion style
- With integrated display and without, analog outputs as well as IO-Link and HART



## Inductive Sensors Turck - Uprox 3 Series

- Programming and feedback via IO-Link
- Switching Status, Stability and RPM available
- Diagnostics and temperature readings

# SMART SENSORS



## Reflective Photoeye Banner - Q4X

- Marginal/Stable Feedback
- Laser burnout detection to prevent downtime
- Programming and feedback via IO-Link



## Vision Sensor Banner - iVu Series

- Image based sensor for item detection, matching, part positioning or color verification, barcode reading
- IP67 housing, integrated ring light, grayscale, color, infrared and UV
- Ethernet/IP, ModbusTCP, Profinet and more



## Measurement Array Banner - EZ-Array

- IO-Link, Modbus-RTU and RS-485 feedback
- Product Sizing and Profiling
- 2.5mm resolution

# CONTROL PANEL



## Molded Case Circuit Breaker Eaton - Power Defense Series

- Monitor energy usage to lower costs
- Estimate remaining life to prevent down-time
- Adjustable trip settings for flexible operation



## Cabinet Guard Sensor Turck - IM12-CCM Series

- Monitor Temperature and Humidity of control cabinets
- Monitor door closure, external sensor or IR
- Data available via IO-Link



## Variable Frequency Drive Parker - AC30 Series

- Energy usage feedback
- Motor status and line quality feedback
- Control and feedback via fieldbus

# CONTROL PANEL



## Power Supply Wago - Pro2 Series

- IO-Link and Modbus for configuration and diagnostics
- Configurable trip current and delay
- Overload protection and 150% power boost
- 1-phase and 3-phase variants available



## Current Monitoring Murrelektronik - Mico Pro Series

- Early failure prevention with 90% load feedback
- Avoid inrush spike with start-up of channels
- Channel condition saved during power loss for simplified troubleshooting



## Wireless Touch Button/Indicator Banner - K70 Series

- Wirelessly set color and flash patterns to feedback status to operator
- Operator feedback and control from remote locations or in harsh environments without wiring



# GATEWAY



## Wireless Gateway Parker - SensoNODE Gold

- Connect to wireless sensors throughout the facility
- Node programming and ability to route and log messages locally or to the cloud
- Ethernet, Wi-Fi or Cellular connections to internet or intranet only



## Wireless Gateway Banner - DXM

- Connection to large range of wireless sensors
- Data push to Banner cloud or any IP
- Data polling available via API



## Gateway Module Parker - PVSG

- Capture diagnostic CAN messages
- Bridge CAN to Wi-Fi or Ethernet
- Modules with GPS and 4G available

# CONTROL



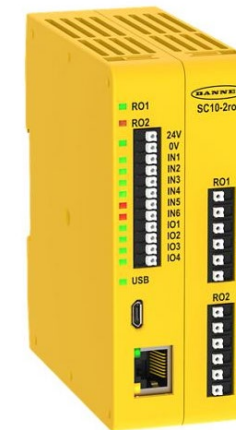
## HMI/Panel PC Eaton - XP500 Series

- Programming via CODESYS, VB scripting, 3rd party programs
- Ability to play media, serve web pages, SQL interface
- Dual ethernet port for separation of IT & OT networks



## Machine Controller Wago - PFC200 Series

- 2x Ethernet, 1x RS-232/485, SD card
- EthernetIP, CANOpen, ModbusTCP protocols available
- Webserver for UI
- Built-in radio module for SMS and Internet connectivity
- AWS and AZURE connectivity, MQTT, JSON, OPC UA data connections



## Safety Controller Banner - SC10 Series

- ISD (In-Series Diagnostics) for diagnostic data on safety devices
- Feedback about safety circuit status available via EthernetIP and ModbusTCP
- Drag-and-drop configuration

# NETWORKING



## Managed & Unmanaged Switch Wago - 852 Series

- 10/100/1000 6 or 8 ports
- -40-80C Storage Temp
- MAC Security IEEE802.1AE



## Wireless Gateway Wago - 758 Series

- IP-67
- Bluetooth or WLAN
- Compatible with Ethernet protocols: Profinet, Modbus/TCP, Ethernet/IP



## Managed Switch Turck - TBEN-L Series

- IP67 protection, 1Gbit/s data rates
- 10-port managed switch
- Separate IT and OT networks with VLAN

# REMOTE I/O



## Modular I/O Wago - 750 Series

- Large Fieldbus Selection - Ethernet/IP, EtherCAT, Profinet, Modbus TCP, BACnet/IP, Profibus, CANOpen, Modbus RTU,
- Specialty modules such as weigh modules, DC motor drive, stepper drive, RS-422 and high-speed counters, intrinsically safe, PROFIsafe



## Modular I/O Turck - BL67 Series

- IP-67 Remote I/O Blocks
- Large range of I/O and connector styles
- Large range of Fieldbus: EthernetIP, Profinet, ModbusTCP, CANOpen, DeviceNet, Profibus-DP



## Block I/O Turck - TBEN Series

- Protection class IP65, IP67, IP69K
- Multiprotocol fieldbus connection for placement close to sensors
- Diagnostics for each channel: overload, short circuit or wire break
- Isolated channels

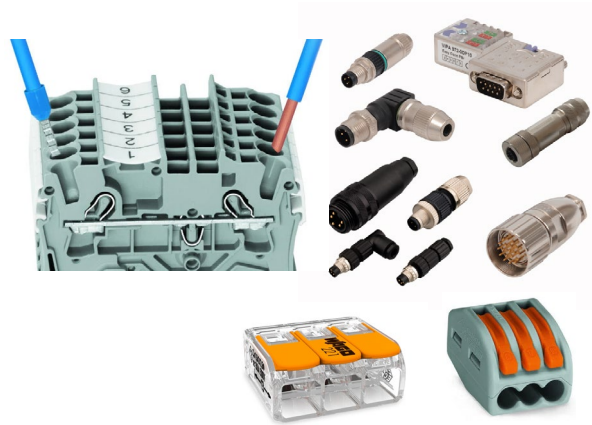


# CONNECTIVITY PRODUCTS



## Cordsets & Cables

- Single ended, double ended and panel mount cables
- RJ-45 and M12 Networking cables
- Armored and Weld Spatter resistant
- High-flex
- Bulk cabling without connector



## Connectors & Terminals

- Field wireable
- DIN Rail Terminal Blocks
- Wire Splice Connectors
- PCB Terminals



## Cable Entry & Access

- up to IP66/4X protection,
- For use with cables with and without connectors
- Access Panels for Data and Networking as well as power, metal or plastic frames



# UL PANEL SHOP



## EXAMPLES OF CONTROL PANELS WE CAN BUILD:

- Machine controls
- PLC control panels
- Closed loop motion controllers
- AC/DC drives and related controls
- Operator consoles
- HMI panels
- Hydraulic power unit control panels
- Farming/irrigation pump panels
- Softstart pump panels





# CAPABILITIES

## Products

Actuators, Stages & Cylinders	Filtration	Pneumatics
Automation Components	Gauges & Measurement	O-Rings & Seals
Compressed Air Equipment	Hose, Tubing & Fittings	Sensors & Switches
Controls	Hydraulics	Tools & Assembly
Drives & Motors	Machine Safety	Vacuum
Electrical	Mobile & Truck	Valves

## Services And Capabilities

24 Hour Mobile Hose Service	Cylinder Interchanges	Rental Units/Equipment
Seal Kitting Services	Hydraulic Component Repair	Vendor Managed Inventory
Hose Kitting Services	Tube Bending and Fabrication	

## Engineered Solutions

Control Systems & Enclosures	Pneumatic Systems & Assemblies	Schematics
Standard Hydraulic Power Units	Seal Engineering	Custom Machine Guarding
Custom Hydraulic Power Units	System Installation	Workstations & Workcells
Custom Hydraulic Manifolds	System Design	

## Technologies

Automation	Filtration	Machine Safety
Compressed Air & Pneumatics	Hose, Tubing & Fittings	Seals & Engineered Materials
Controls/Control Panel	Hydraulics	
Electromechanical	Mobile Controls & Hydraulics	



## People, Products & Performance

With Controlled Motion Solutions, you will find more than a distributor; we are a solutions provider. Comoso provides solutions to virtually everything that moves or requires control. As your fluid power specialist, we provide motion and control technology systems and engineering services for a wide variety of commercial, mobile and industrial markets.

### Our Product Expertise:

- Actuators, Stages & Cylinders
- Automation Components
- Compressed Air Equipment
- Controls
- Drives & Motors
- Electrical
- Filtration
- Hose, Tubing & Fittings
- Hydraulics
- Machine Safety
- Pneumatics
- O-Rings & Seals
- Sensors & Switches
- Vacuum
- Valves
- Mobile Controls
- UL508a

## LOCATIONS

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SUN VALLEY**  
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Sun Valley, CA 91352  
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818.238.9283 fax

**INLAND EMPIRE  
CORONA**  
950 El Sobrante Road  
Corona, CA 92879  
951.582.7007 tel  
951.735.2106 fax

**CHULA VISTA**  
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Chula Vista, CA 91911  
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619.424.9918 fax

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Escondido, CA 92029  
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760.781.3550 fax

**SACRAMENTO**  
West Coast Fluid Power Div.  
5370 S. Watt Ave Suite 300  
Sacramento, CA 95826  
800.532.8837 tel  
800.370.0447 fax



RemoteConnectivity Rev1.2