

ANNEX1 Smart Pumper™ Capabilities



Control Artificial Lift Devices

- Rod Pumps
- ESP's
- Progressive Cavity Pumps
- Jet Pumps
- Electric Tower Pumps
- Permanent Magnet Motors
- Hydraulic Tower Pumps
- Gas Lift and Plunger Lift

Monitor / Control Motors

- Control VFDs (any type)
- Control Chemical Pumps
- Control Diesel Engines
- Control Motor Speed
- Control Valves Open/Close
- Control Fluid Level
- Control Relays
- Control Tank Levels

Data Logging, Alerts and Reporting

- Monitor Line Voltage
- Monitor Motor Voltage
- Monitor Current
- Monitor Torque
- Monitor Horsepower
- Monitor Wellhead Pressure
- Monitor Flow line Pressure
- Monitor Casing Pressure
- Monitor Tank Levels
- Monitor Metered Flow Rates
- Monitor Gases (H₂S, CO, Ethane)
- Any Sensor and Meters

Monitor Downhole Conditions

- Control Pump Speed to Achieve and Maintain Targeted Fluid Level
- Monitor Temperature
- Control Downhole Heater (Reduce Viscosity)
- Conduct 24/48 Hr. Reservoir Build-up Tests



Chemical Injection Pumps

- Control and Monitor a series of Chemical Injection Pumps
- Controls Chemical Injection in Harmony with Artificial lift Automation for Precision Chemical Dosing
- Quantifies Usage and Inventory (Daily, Monthly and Cum from Start)
- Tank Level Monitoring (high/low warnings)
- Sends Low Inventory Alert to Supplier and Operator to Refill
- Set Injection Pump Pressure Warnings and Limits
- Control Valves to regulate flow direction at a Manifold



Water / Fresh / Produced / Reuse / Disposal Facilities

- Monitor Water Quality (Supports all types of sensors)
- TDS (Total Dissolved Solids)
- Ba (Barium)
- TSS (Total Suspended Solids)
- Sr (Strontium)
- pH, Cl (Chloride), B (Boron), HCO₃ (Bicarbonate), SG (Specific Gravity), P (Phosphorous), ORP (Oxidation Reduction Potential), TOC (Total Organic Carbon), H₂S (Hydrogen sulfide), APB (Acid producing bacteria), Ca (Calcium), SRB (Sulfate Reducing Bacteria), Mg (Magnesium), HB (Helicobacter), Fe (Iron), HAB (Heterotrophic Aerobic Bacteria), Etc.
- Quantifies Usage and Inventory



Monitor and Recover Flow Meter Data

- 4-20mA, A-D, Pulse (*Clean and Dirty Signal*) and Modbus

Generate Meter Reports

- Current 24-Hour Period, Previous 24-Hours, Current Month
Last Month, Cumulative Positive Direction
Cumulative Reverse Direction

Natural Gas Compressors

- Monitors Suction Pressure
- Discharge Pressure
- Inter-stage Pressure & Temperature
- Third Stage Pressure
- Monitor Fuel Levels
- Compressor Vibration Sensor
- Engine Oil and Coolant Levels
- Gas and Engine Temperatures
- Monitor Fuel Pressures
- Control Engine on/off and monitor RPM
- Monitor Meters and Tank Levels
- Monitor make-up gas valve (open/closed)

Water Reservoir and Transfer Control

- Quantifies Reservoir Volume and Height
- Auto fill Reservoir controlling water well
- Monitors Water Quantify
- Controls Transfer Pumps on/off and speed, Controls Booster Pumps on/off, Control Pump Priming Auto/Manual, Control VFD
- Monitors Line Pressure and Meters Flow
- Monitor Engine Temperature, Monitor Fuel Levels, Start Stop Diesel Engines
- Control Valves, Monitor / Control Remote
- Set Alerts (Warnings and Faults) for any condition
- Tank Height and Volume Calculator