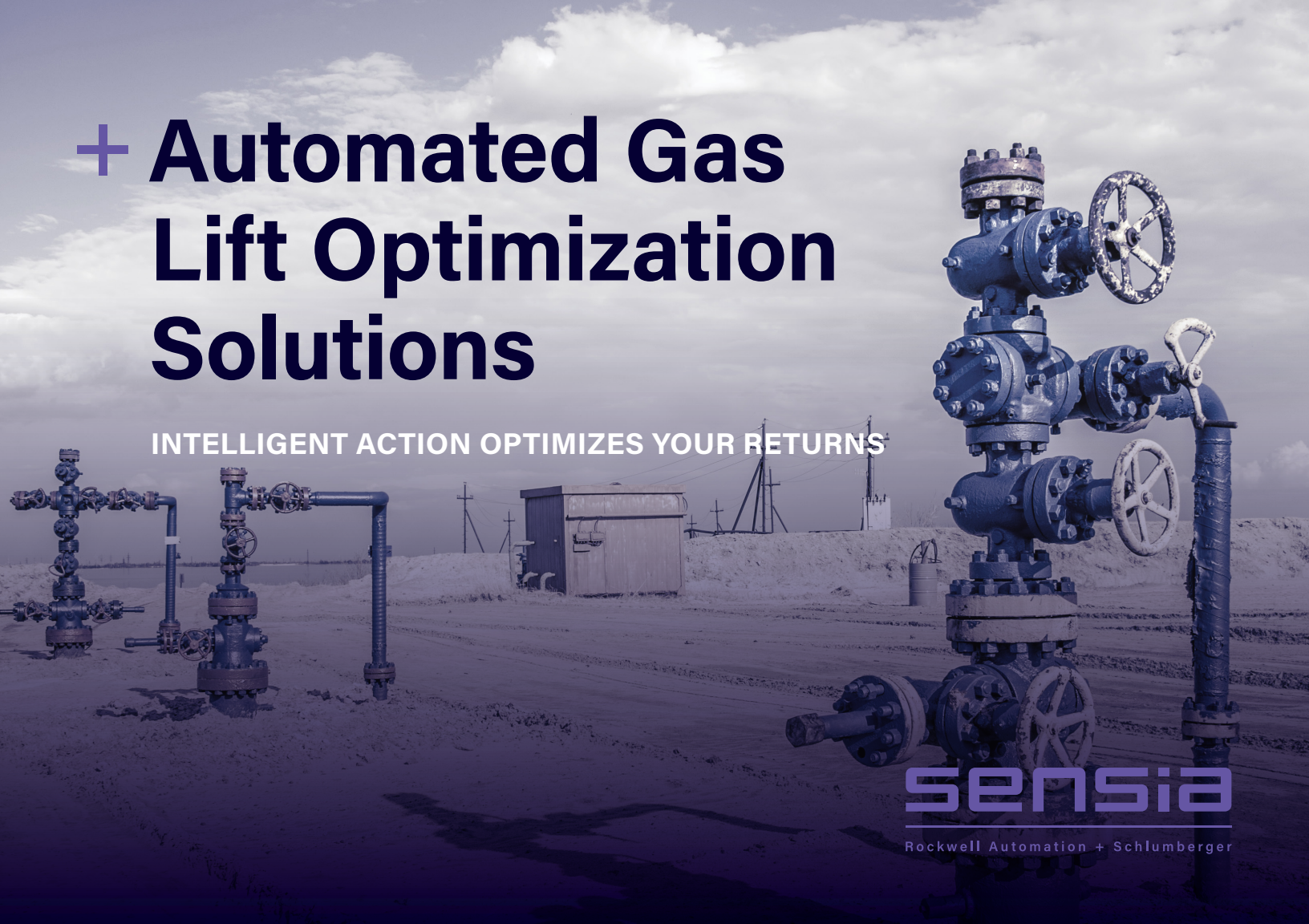

+ Automated Gas Lift Optimization Solutions
INTELLIGENT ACTION OPTIMIZES YOUR RETURNS
sensia
Rockwell Automation + Schlumberger

AUTOMATED GAS LIFT OPTIMIZATION SOLUTIONS

+ When you need more oil for less...

In a typical well, up to 5% of production shortfall can be attributed to gas lift operational inefficiencies. Automated Gas Lift Optimization solutions from Sensia ensure responses in minutes not days.

Sensia solutions enable you to reduce production shortfalls, reduce the quantity of gas that you use, and reduce manual interventions.

Well processes are continuous. But surveillance, interventions and optimization are still carried out manually, and therefore intermittently, in most cases. Chokes are set, but not constantly controlled, and this inevitably means that operators are injecting suboptimal amounts of gas than is actually required to maximize the flow rate of reservoir liquids.

COMPLETE CONTROL. FASTER RESPONSE TIMES.

By automating gas lift optimization – rather than intervening manually – your response to events happens in minutes rather than days. As well as reducing production shortfalls, management time will be freed up to improve the business, rather than firefighting day-to-day issues. We've shown in recent field trials that manual interventions can be reduced by up to 85%.

... INTELLIGENT ACTION DELIVERS

Sensia delivers Intelligent Action – the unification of measurement, intelligence and action – to optimize decisions and dramatically reduce the time and interactions between detection, diagnosis and resolution. We can methodically guide you on your automation and digitalization journey to solve the challenges you face in gas lift surface optimization.

+ 15% GAS SAVING
+ 85% FEWER MANUAL INTERVENTIONS
+ RESPOND IN MINUTES, NOT DAYS

AUTOMATED GAS LIFT OPTIMIZATION SOLUTIONS

+ Intelligent Action differentiates Sensia from the competition.

1. **Our comprehensive solutions cover all levels of gas lift optimization.**
2. **We can build the foundation today with monitoring and surveillance and we can deploy a completely automated gas lift well.**
3. **As we continue to add functionality, we are building on these foundations to implement a fully autonomous, digitalized field – from well to facilities.**
4. **All of the building blocks – individual products and expertise – are available from one source, ensuring an efficient and effective digitalization journey custom-engineered to optimize your gas lift operations.**

It's your journey. That's why our site automation solutions are focused on syncing with:

+ your well economics
+ your corporate philosophy, culture, strategy and objectives
+ global variations
+ specific operating environments
+ available power
+ site accessibility
+ onshore/offshore requirements and differences
+ your existing infrastructure

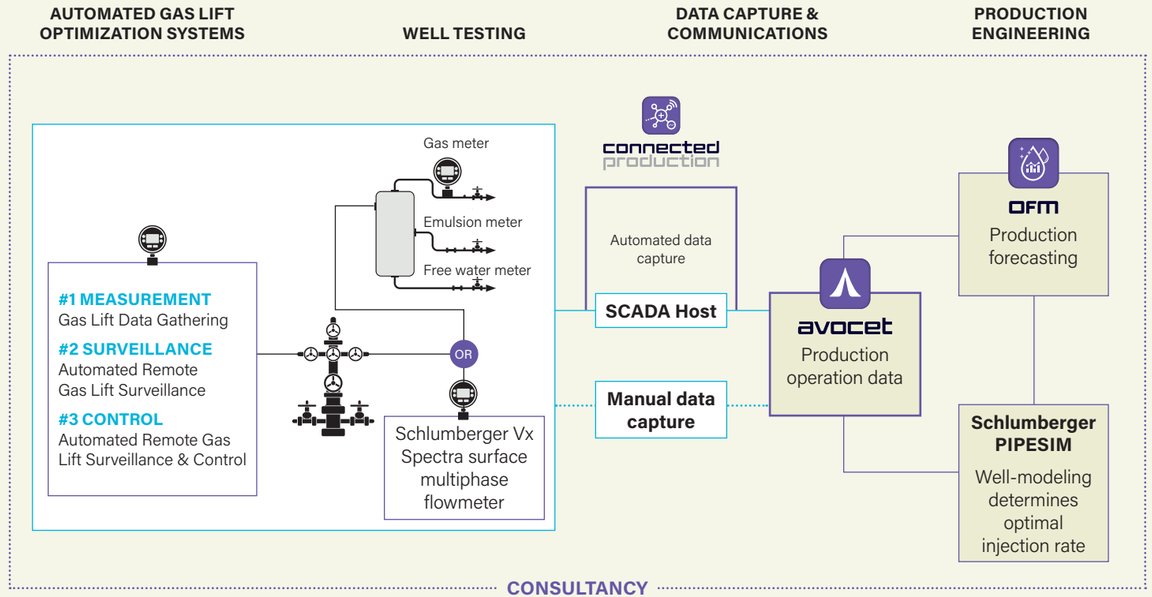
AUTOMATED GAS LIFT OPTIMIZATION SOLUTIONS

+ Choose your gas lift automation level

Current Oil & Gas market conditions are driving gas lift operators to seek the highest production possible from the lowest input costs. Achieving cost reducing optimal efficiency requires software tools to manage and contextualize information into wise operating decisions.

While Sensia's software can acquire data from a variety of measurement sources our field instrumentation packages offer a path for increasing the degree of automated data collection and on-site gas lift control. This architecture supports a progressive deployment in a tight CAPEX budget environment so you can progress toward automatic optimization without delay.

We currently offer three levels of configure to order (CTO) automated gas lift optimization systems. These are the foundations and the first steps to full autonomy and field optimization.



AUTOMATED GAS LIFT OPTIMIZATION SOLUTIONS

#1 MEASUREMENT BASED SYSTEM

Gas Lift Data Gathering

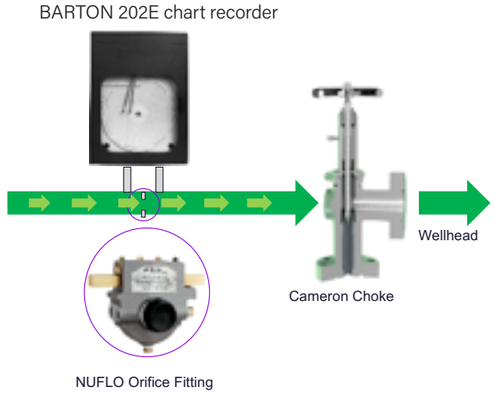
These systems rely on wellhead visits to collect gas injection history and to manually adjust the choke to set the injection flow rate. These packages derive much of their ultra-low CAPEX status from the fact that onsite power generation or other utilities are not required.

Both systems are proven to be robust with tens of thousands of deployments using both BARTON* measurement technology and NUFLO* measurement technology.

MECHANICAL SYSTEM

+ **BARTON 202E chart recorder**
+ **NUFLO single chamber orifice fitting (or equivalent)**
+ **Cameron manual choke (control valve)**

Advantages
The circular chart enables visiting operators to ability to see history at a glance without a PC or tablet. Affords the opportunity to investigate any unexpected prior results before leaving the site.



DIGITAL SYSTEM

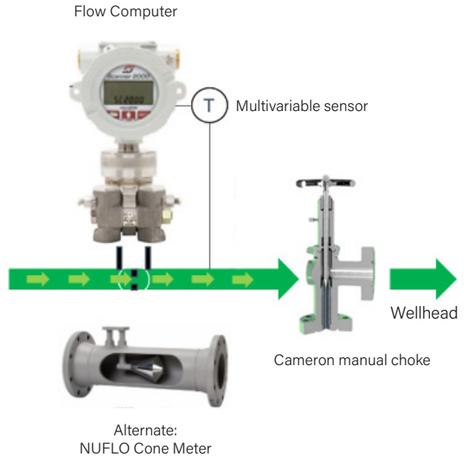
+ **NUFLO Scanner* 2000, 2100 or 2200 flow computer**
+ **NUFLO single chamber orifice fitting (or equivalent) or NUFLO Cone Meter**
+ **Cameron manual choke (control valve)**

Data is captured in a secure and reliable digital file with nominally 10x the accuracy available from a mechanical system. A copy of the data file is downloaded to a PC for transport off-site where it can be assessed by ScanData* scanner data analysis and reporting software and imported into Avocet* production operations software.

Multiple months of detailed history supports extended intervals between site visits.

The NUFLO Scanner 2000 flow computer is the most compact model. NUFLO Scanner 2100 and 2200 offer larger housings with is a helpful provision in the upgrade path to support additional wellhead measurements, automatic data collection or remote control.

All measurements taken by NUFLO Scanner flow computers are compliant to API 21.1 and many other international measurement standards.



#2 SURVEILLANCE BASED SYSTEM

Automated Gas Lift Remote Surveillance

+ **NUFLO Scanner 2000, 2100, and 2200 flow computers or QRATE Scanner* 3100 integrated control flow computer**
+ **NUFLO single chamber orifice fitting or NUFLO cone meter**
+ **Cameron manual choke**
+ **Power and communications sub-system**

Fast centralized indication of unexpected problems, automatic data collection by any Modbus based Scada system including Avocet production operations software with visualization by ConnectedProduction connected oil and gas platform.

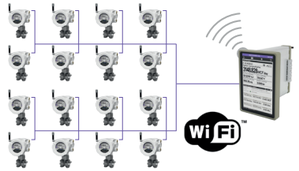
The preferred model of NUFLO Scanner or QRATE Scanner is selected based on area electrical classification, and wellsite monitoring and control beyond gas lift only.

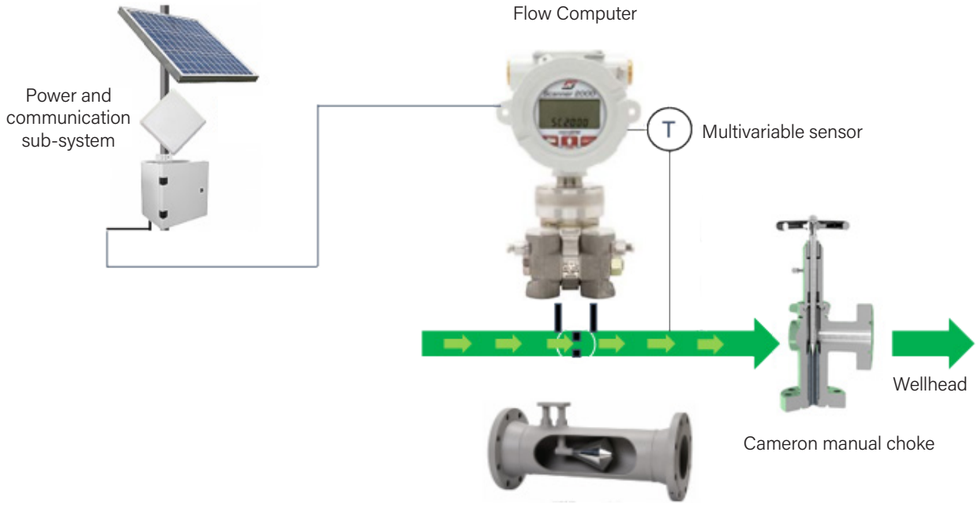
Easily upgradable to remote control.

+

ADD
MULTI-WELL AUTOMATION INNOVATION

The close wellhead spacing of pad production benefits from the multidrop wired or wireless deployment of the self-integrating distributed measurement and control network. This alternative sub-system uses a model 300 QRATE Scanner acting as a redundant single point interface to a network of autonomous NUFLO Scanner 2000 flow computers.





AUTOMATED GAS LIFT OPTIMIZATION SOLUTIONS

#3 CONTROL BASED SYSTEM

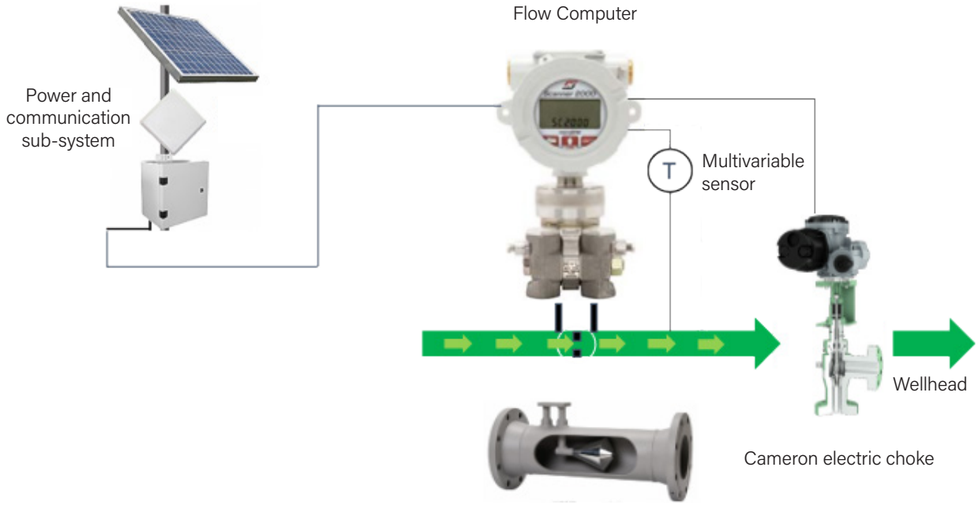
Automated Gas Lift Remote Surveillance & Control

+ **NUFLO Scanner 2000, 2100, and 2200 flow computers or QRATE Scanner* 3100 integrated control flow computer**
+ **NUFLO single chamber orifice fitting or NUFLO cone meter**
+ **Cameron manual choke**
+ **Power and communications sub-system**

In response to the dynamics in the injection gas and production gathering systems, the flow computer automatically adjust the choke to maintain the flow and pressure setpoints that it has been assigned.

The cost of the electric choke and associated power is often quickly offset by easily assigning and automatically maintaining optimization targets communicated by ConnectedProduction platform or other Scada HMI.

Simultaneously meticulous record keeping by Avocet software support accounting and operation requirements.

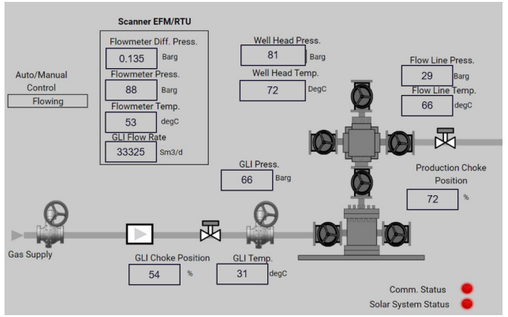


#4 OPTIMIZED LEVEL SYSTEM

Automated Gas Lift Optimization

ConnectedProduction is Sensia's digitization platform providing powerful data gathering, contextualization, visualization and analytics functions. It allows operators to monitor current and historical parameters from gas lift facilities and to send revised optimization flow targets to the flow computers at the well site.

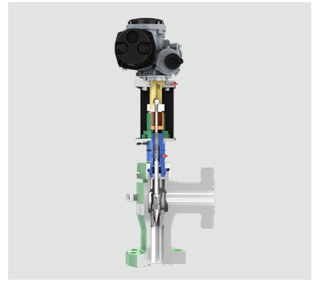
Operators can do that on a centralized location or wherever they are located. ConnectedProduction is offered On-premise or In The Cloud. It is the platform for all of Sensia's artificial lift technologies.



Proven Technology

NUFLO Scanner 2000 flow computers and QRATE Scanner 3000 integrated control flow computers with multivariable sensor are offered in multiple models, so they match the requirements of autonomy in a traditional wide spaced production field or auto-network to speed deployment and protect data in a multi-well site.

With inherent flow conditioning capabilities, the use of a **NUFLO cone meter** provides a compact weight reduced flow measurement location with excellent flow rangeability.



Cameron Chokes manufactured by Schlumberger are offer by Sensia for automated flow and pressure control. These 24 VDC electrically actuated chokes are powered by solar power where no other energy source is available. All Cameron chokes feature rugged 6A construction.

Solving challenges from the reservoir to refinery. One challenge at a time.

We collaborate with all stakeholders to make the production, transportation and processing of oil & gas simpler, safer, more secure, more productive and better understood from end-to-end. Sensia is making the advantages of industrial-scale digitalization and seamless automation available to every oil & gas company. Now every asset can operate more productively and more profitably.

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