



KUDU
INDUSTRIES INC.



PCP
WELL MANAGER
VARIABLE SPEED DRIVE

SAM PCP Well Manager™

Optimize Your
Progressing Cavity Pump

Getting the Most Out of Your Well

- Integrated system maximizes production
- Automatically monitor and adjust pump speed
- Protect against pump off

Bringing solutions to the surface since 1989.



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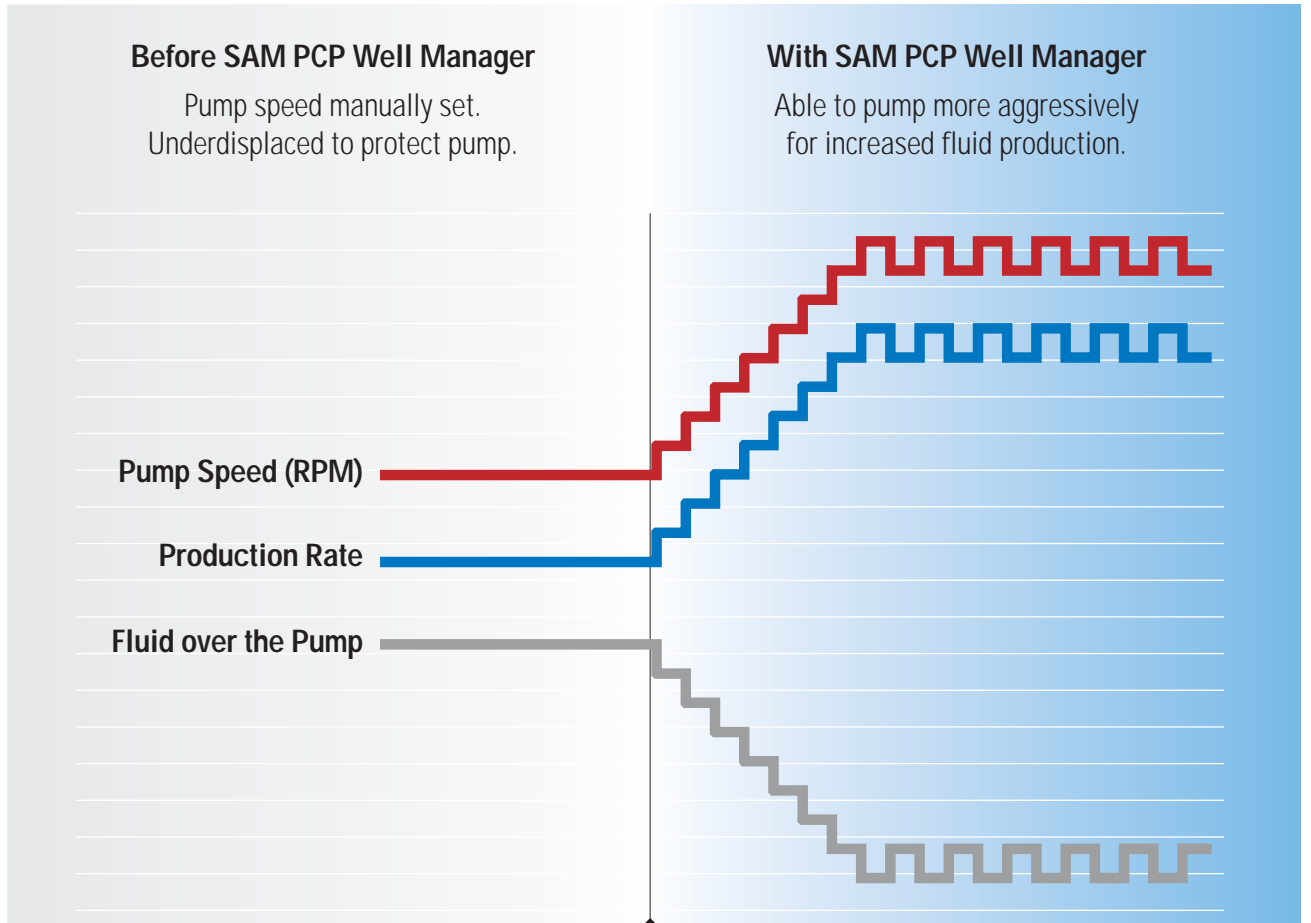
20 YEARS OF INNOVATION
1989 - 2009

Control Your Progressing Cavity Pump

KUDU Industries and Lufkin Automation have joined forces to offer an innovative system that maximizes your production through smart well technology. The SAM PCP Well Manager optimizes your production by adjusting pump speed, monitoring torque and measuring flow rates. Controlling PCP's with the Well Manager helps reduce premature pump failures due to pump off and decreases the field monitoring of fluid levels. The SAM PCP Well Manager is CSA approved as well as IPC and ISO certified.

The LUFKIN Automation PCP Algorithm

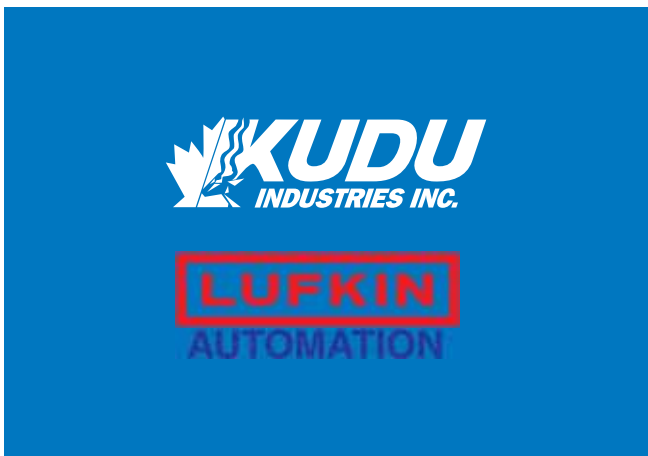
The PCP control algorithm enables the Well Manager to change, monitor and measure critical elements to ensure maximum productivity is achieved. The Well Manager algorithm controls well speed based on measured production rates. If torque becomes an issue, the algorithm takes control of the pump's speed based on trend parameters.



Pre-SAM PCP Well Manager

SAM PCP Well Manager Installation

SAM PCP Well Manager in Operation



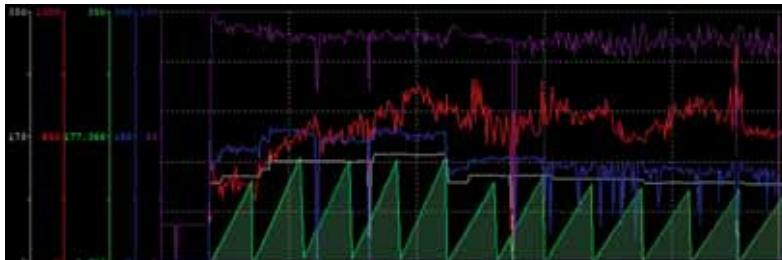
Proven Performance

Heavy Oil

Field	API	Average Water Cut	Initial Flow Rate
Pelican Lake, AB, Canada	17	25-99%	30m ³ /day to 300m ³ /day

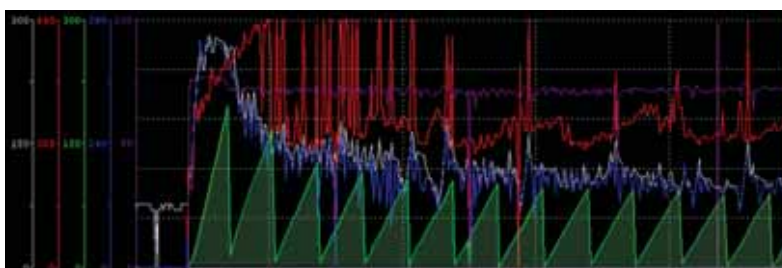
Without SAM PCP Well Manager

The oil well had a slow startup and the BS&W rate initially peaked at 100%, then gradually reduced. Adjustments to the rpm were based on daily acoustic fluid level shots, with the Operator making decisions to manually increase or decrease rpm according to the data. As the graph to the right illustrates, the well required frequent operator intervention and was never optimized.



With SAM PCP Well Manager

The operator installed four Well Managers and used the example shown to the right as a showcase well. The PCP quickly achieved 99.9% well optimization following downtime. The initial high rpm start up gradually slowed down over a two week period in order to automatically adapt to changing inflow conditions. The projected yearly increase in revenue due to optimization of the four test wells is \$365,000. The operator has since installed ten additional SAM PCP Well Managers in the same field.

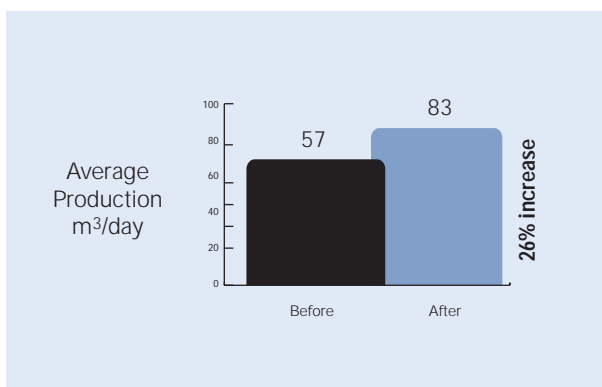


Production is shown in green areas.

Medium Oil

Field	Scots Lake, AB, Canada
API	26
Average Water Cut	97%
Initial Flow Rate	80m ³ /day to 580m ³ /day

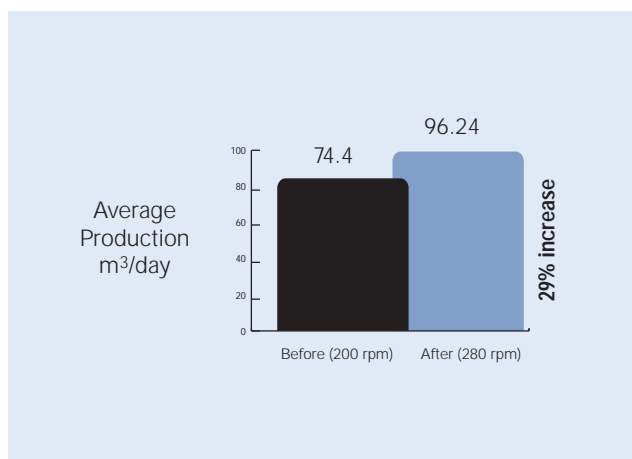
After installing a SAM PCP Well Manager, the average production increase was 40m³/day/well, which equates to 1.6m³/day/well in additional oil production. The oil cut improved by 0.5% and gas production increased from 19 10³m³ to 23 10³m³. The operator used a SCADA system to determine well status at the beginning of each day. The operator was able to detect problems early and facilitate quick corrective action.



Light Oil

Field	Cessford, AB, Canada
API	30
Average Water Cut	94%
Initial Flow Rate	74.4m ³ /day

This well originally ran at an average 200 rpm with 15 to 16 joints of fluid above the pump. After installing a SAM PCP Well Manager, the well's average rpm is 280 and the production rate increased by 29% to 96.24m³/day with a fluid level of 1 to 6 joints above the pump.



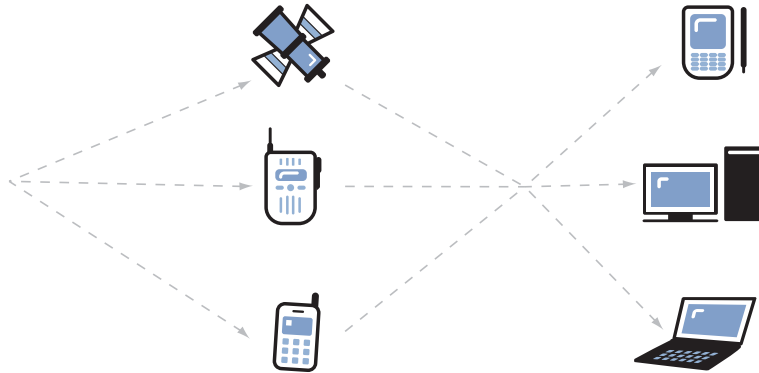
Well Information and Performance

The SAM PCP Well Manager's data logging provides real time centralized information. The Well Manager uses a Supervisory Control and Data Acquisition system (SCADA). This diagnostic tool enables

the user to view and implement changes remotely. SCADA offers a comprehensive interface between the user and well by providing the information you want, when and where you need it.



SAM PCP Well Manager with SCADA



Send data via: satellite, radio or phone

View and control information conveniently over the web

KUDU's Complete PCP System

KUDU provides the perfect fit for any environment with Pumps, Driveheads and Power Units engineered to handle the most demanding applications. Start optimizing your operation, contact a KUDU representative today.



Key Benefits

- Optimize well production
- Protect against pump off
- Provide torque protection
- Log historical data
- Analyze well data and performance
- User-friendly keypad & display



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Australia
Tel: +07 3842 3105
Email: australia@kudupump.com

Middle East
Tel: +968 9550 1017
Email: middleeast@kudupump.com

South Central America & Mexico
Tel: +1 281 296 1602
Email: southamerica@kudupump.com

KUDU INDUSTRIES INC.
HEAD OFFICE & MANUFACTURING
9112 – 40th Street SE
Calgary, AB Canada
T2C 2P3
Tel: +1 403 279 5838

Kazakhstan
Tel: +7 727 259 7630
Email: kazakhstan@kudupump.com

Russia
Tel: +7 342 249 8594
Email: russia@kudupump.com

North America
Toll Free: +1 800 642 5519

www.kudupump.com