

SMARTEN Pump-Off Controller for Rod Lift Wells

Maximize production and minimize stress on pumping equipment

APPLICATIONS:

- Rod lift wells with:
 - High fluid pound
 - Suboptimal fluid level draw-down
 - High failure rates
 - Low fluid levels

BENEFITS

- Provides simplified and customizable user interface
- Optimizes idle times based on historical run times with local idle time setpoint optimization
- Delivers simplified valve check procedures for standing and traveling valves
- Offers pump tag detection and mitigation
- Leverages Theta™ optimization data science for more accurate and real-time control
- Optimizes chemical injection programs and artificial lift equipment through a single controller

For operators using rod pumping systems, the primary goal is to achieve a pumped off condition to maximize production and minimize failures of surface and downhole equipment.

Pump off controllers (POCs) are used to help detect failure-related issues such as incomplete fillage, pump tagging, belt slippage, high torque, etc. to operate more cost efficiently and effectively. SMARTEN™ POCs allow you to view extensive data through an easy-to-use interface, so that you can proactively optimize your rod pumping system.

SMARTEN 5.0 firmware release

The latest SMARTEN firmware release offers many new features to maximize your pumping unit system's performance. Leveraging what has been field-proven in our XSPoC™ production optimization software, idle time setpoint optimization can now be controlled at the edge. The SMARTEN controller optimizes idle times based on historical run times and production data while reducing cycling of the pumping unit. Putting this capability at the



wellsite eliminates connection or lag issues, allowing you to optimize setpoints in real time. We have also added additional process variable controls, so you can control the system with alternative methods to traditional dynagraph card interpretation. The new controls include pump intake pressure, fluid load, and fluid over pump. This is especially useful for problematic wells that have complex dynagraph card readings. With the latest release, the SMARTEN POC can also detect and mitigate pump tags to automatically engage intrastroke speed changes rather than manually setting up zones, helping reduce costly pump and rod failures. With the addition of the gearbox torque screens, the controller graphically displays the torque over a 360-degree revolution of the crank to easily view the position and load of the crank. The SMARTEN 5.0 release has many other exciting updates and features focused on putting more information at the edge, so you can make data-driven decisions to optimize your pumping unit performance.

The SMART choice

Built on the SMARTEN controls platform, you reap all the benefits of our advanced SMARTEN technology. This includes storage capacity of more than 3,000 dynagraph cards that you can save directly to your computer from the field. You can also take advantage of SMARTEN Live which allows you to access the controller remotely and make operational changes as if you were on location.

And our iChem™ chemical optimization logic is now available in the SMARTEN hardware, so you can cost-effectively optimize your chemical injection programs and artificial lift equipment through a single controller.

Contact your local representative or visit ChampionX.com/SMARTEN to learn how SMARTEN pump-off controllers can provide the data you need to maximize performance of your rod pumping systems.

SMARTEN pump-off controller specifications

I/O	
Analog inputs	Qty 4 - configurable 0 to 10V, 0 to 20mA, 4 to 20mA
Load cell analog input	Qty 1 - 20mV max input
Analog outputs	Qty 1 - configurable 0 to 10V, 0 to 20mA, 4 to 20mA
Discrete inputs	Qty 8 - signal level; configurable for pulse counting up to 1Khz; 5V and 24V isolated power available
Discrete outputs	Qty 6 - firmware configurable as dry contact emulation or direct 12V DC output
Rod pump load and position	
Loadcell support	Compatible with industry standard loadcells (30k, 40k, 50k)
Analog position device	Yes
Hall effect position device	V 4.1 and higher
Human machine interface	
Display	800x480 resolution; high brightness; sunlight readable
HMI	7-in. capacitive touch
UI	HTML 5; can also be viewed on PC or tablet running a standard web browser
Connectivity	
Wi-Fi	Wi-Fi standard (can disable feature)
USB	USB port for software upgrades or data downloads
SD card slot	SD card slot for additional storage
Serial ports	3 configurable RS232/RS485
Modbus protocols	Modbus TCP, RTU
Construction	
Enclosure	Aluminum powder coat, hinged door with two lockable hasps
Environmental ingress	IP65/NEMA 4
Operating temperature	Electronics rating: -40 to 185°F (-40 to 85°C)
Power	
Primary power to the switching supply	100 to 240 VAC, 50/60 Hz
AC input	2.0 Amp circuit breaker
DC input	Operating 11V-15V DC, nominal 12V
Power consumption	10 Watts
Computing core	
Processor	AM335 x 1GHz ARM Cortex-A8
Memory	512MB DDR3 RAM
Storage	4GB 8-bit eMMC flash storage
Software	Embedded Linux OS
Certifications	
USA and Canada	Conforms to UL STD 508A and CSA STD C22.2 No.14
International	Conforms to 61439-2, IEC61000-6-2, IEC61000-6-4

Theta Automation and Optimization | 10648 West Little York | Houston, TX 77041

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