SMARTEN™ Retrofit Kit

Retrofit Kit for Rod Pumping Controllers and Variable Speed Drives
Upgrade or Replace Existing POCs with SMARTEN™

Are your existing Rod Pump Controllers dated or not functioning properly? Are there components you need replaced but don’t want to pay for a new unit? Are you being pressured to upgrade to a higher cost unit or higher cost replacement parts? The SMARTEN retrofit kit enables you to easily convert legacy Pump Off Controllers into modern units, and in a cost-effective manner. The conversion process utilizes all existing infrastructure, and is simple to install on either stand alone POCs or integrated VSDs. Bottom line, keep your equipment running intelligently, and in a cost-effective manner.

Path to Retrofit

The retrofit process is simple; service work can be completed quickly compared to new POC install. The retrofit is simplified by:

- An inner door replacement with a small amount of wiring, allowing for quick installation and setup
- The ability to utilize existing load and position components, as well as communication equipment and devices.
- Simple user interface compared to other units on the market, with quick setup capability

Key Features

- User friendly and flexible “Go-Live” – HTML5 Web interface
- Live surface and downhole cards
- Easily configurable, but highly customizable unit, allows all levels of experience to operate the unit
- Easy-to-use 7” touch screen
- Simple firmware updates can be done onsite or remote

Real-Time Dyno Cards

Current Pump Fillage Setpoint
Pump shuts off for designated amount of time if below fillage set point.

What does the Kit Include? How does the install work?

The Retrofit Package

Replace standalone POCs, controllers integrated with VSDs, or VSDs in the field. Included in the standard retrofit kit is a door replacement kit which includes:

- 7” touch screen
- Motherboard & processor
- Wiring
- Power supply unit (POCs) only
- Ancillary items
- Available Wi-Fi (optional feature)

Enhanced Connectivity Over Legacy Units

- Storage for 180-day operational history including Dynagraph cards every hour for 60 days and every event
- Full SCADA capabilities
- Advanced Theta XSPOC™ monitoring and “Go-Live” integration
- Upgradeable on-site or via a remote connection
- Built-in XSPOC capabilities

Restore Obsolete Pump Off Controllers & VSD’s

- The retrofit kit can be installed on both existing stand-alone POCs or integrated VSDs.
- Communications equipment, Inverters, DBRs, and other VSD specific equipment can easily be serviced or replaced in conjunction with the retrofit kit
- Increase Production Optimization, Reliability, and Efficiency by injecting new technology into existing equipment
- “Go Live” feature provides secure, real-time remote access to the unit, with seamless XSPOC integration
- Customizable malfunctions

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<tr>
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Retrofit Process: Simple and Customizable

The retrofit process is simple, and can be finished quickly depending on what is being replaced and the existing equipment. The process is also highly customizable in that any components of the automation system can be replaced or reconfigured.

The standard process includes a door replacement, switching out brackets/hinges for the door and power supply unit. If existing cables, load/position equipment, and the cabinet can be salvaged and utilized, the entire retrofit can take as little as 1 hour.

SMARTEN Screens & Accessories

Screens and Features

SMARTEN provides a number of quick screens on the controller or remotely via Go Live. Real Time surface and pump cards, quick well status screen updates, customizable I/O and configuration screens, control mode, history, and more are all accessible via SMARTEN to help enhance pumping unit control.

SMARTEN POC Accessories

SMARTEN offers POC transducers to work with all the different pumping unit types. The transducer selection allows the user a preference to choose the system and consider the long-term maintenance requirements. Hall Effect and inclinometer kits are both compatible with SMARTEN. Wired and wireless load cells are available.

Well Status Screen

Well Status Screen provides vital outputs including:
- Real-Time Dyno Cards
- Pump Fillage
- Gearbox Loading
- Structure Loading
- Road Loading
- Fluid Load

Violation-based malfunction set points with customizable downtimes allows enhanced pumping control and troubleshooting.
# SMARTEN™ Retrofit Kit SPECIFICATIONS

## Enhanced Connectivity | Improved Functionality | Unmatched Flexibility

| I/O | Qty 4 Configurable 0-10V, 0-20mA, 4-20mA | Qty 1 20mV max input | Qty 1 Configurable 0-10V, 0-20mA, 4-20mA
| Analog Inputs (AI) | Analog Outputs | | Qty 8. Signal Level. Configurable for pulse counting up to 1Khz. 5V and 24V Isolated Power available |
| Load Cell Analog Input (AI) | Discrete Inputs (DI) | Qty 1 Configurable 0-10V, 0-20mA, 4-20mA |
| Analog Outputs | Discrete Outputs (DO) | Qty 6. Firmware configurable as dry contact emulation or direct 12V DC output |

## ROD PUMP LOAD AND POSITION

| Loadcell Support | Analog Position Device | Hall Effect Position Device | Compatible with Industry Standard Loadcells (30k, 40k, 50k) | YES | V 4.1 and higher |

## HUMAN MACHINE INTERFACE

| Display | HMI | UI | 800x480 resolution, High Brightness, Sunlight Readable | 7” Capacitive Touch |
| | | | HTML 5. Can also be viewed on a Laptop or Tablet PC running a standard Web browser |

## CONNECTIVITY

| Wi-Fi | Available Wi-Fi (optional 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

| Environmental Ingress | Operating Temperature | Aluminum powder coat, hinged door with two lockable hasp |
| | | IP65/NEMA 4 |
| | | -40°C to +85°C electronics, touchscreen rating -20°C to +70°C |

## POWER

| Primary power to the switching supply | AC input | 100 to 240 VAC, 50/60 Hz |
| | DC input | 2.0 Amp circuit breaker |
| | Power Consumption | Operating 11V-15V DC, nominal 12V |
| | | 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 | Rest of World | Conforms to UL STD 508A and CSA STD C22.2 No.14 |
| | | Conforms to 61439-2, IEC61000-6-2, IEC61000-6-4 |

## STANDARD SMARTEN CONTROL FUNCTIONS

- On/Off Pump Off Control
- IO configurable with Device name
- DI and AI configurable for shutdowns (no Logic Expression or Function Block required)
- Custom Functions available through HMI (Similar to Logic Expression or Function Block)
- Well Status screen features Downhole card and 3 quick viewing gauges that are programmable
- Features 7 programmable rod tapers
- Features ability to Upload or Download configuration from HMI to use memory card or wirelessly to laptop via local Wi-Fi
- Real - time notifications of events such as Start Up, Shutdown, Malfunction alerts, gauge-off (cellular Ethernet Network required)
- VSD Slow Speed Shutdown
- VSD Speed Zones
- VSD Communication Via RS485 Comm Link
- Features ability to export stored cards to USB or Mobile device in CSV, JSON, or DYN format
- Features programmable Data Logging of most Parameters via HMI
- Stores up to 3000 dynamometer card sets (5 cards per set) such as All, Idle, Start Up, Timed, Reference, Fault, and Malfunction
- Stores up to 3000 Events such as Start up, Shutdown, Violation, Malfunction, Parameter Change, Well State, Power on/off, and User log in/out
- Ability to Export Event Log and all Trending Data to CSV file
- Data analysis Trending feature and Data Logging for minutely, hourly, daily sampling