



CEO™ Three Plus Plunger-Lift Controller

Weatherford's *CEO Three Plus* plunger-lift controller offers a unique combination of technology and packaging that incorporates proven supervisory control and data acquisition (SCADA) and remote terminal unit (RTU) functionality for plunger-lift well control. The controller is designed to meet remote, unpowered wellsite requirements by using ultra-low-power electronic technology.

Applications

- Remote operations where a power source is not available
- Harsh-environment operations

Features, Advantages and Benefits

- Plunger-lift well behavior is dependent on parameters that differ from one field to another. As a result, it is imperative that a plunger-lift controller be adaptable to meet individual well site requirements. The *CEO Three Plus* plunger-lift controller offers a broad range of control mechanisms for flexible control of plunger-lifted wells and allows the control method to be adapted to specific well needs.
- A built-in, data-logging application comes standard with the *CEO Three Plus* RTU for recording data critical to the monitoring and optimization of each well. Critical input values are logged and stored for historical review. In addition, the controller incorporates a very powerful and flexible multi-channel, data-logging function that can be triggered by certain events to provide valuable information to assist in diagnosing well problems.
- The *CEO Three Plus* controller's advanced interface to host systems supports the latest communications technologies, including radio (licensed, spread spectrum, and Ethernet), satellite, and cellular channels. All information is available for remote access using industry-standard protocols. The controller is fully integrated and supported, incorporating plunger-lift monitoring and optimization software available from Weatherford.

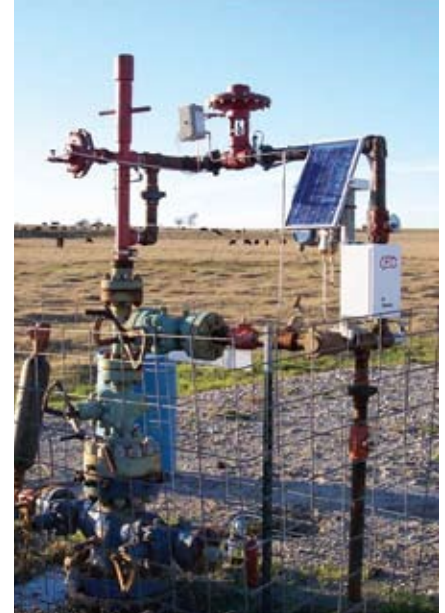




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Features, Advantages and Benefits (continued)

- The CEO Three Plus controller is designed for low-power use and reliable operation in harsh environments. It incorporates a solar power system that allows it to be used in virtually any remote location where local power is not available.
- All hardware for Weatherford's CEO Three Plus plunger-lift controller is packaged in one small enclosure. The enclosure comes standard with the central processing unit (CPU) and input/output (I/O) hardware, and it can accommodate optional radio and/or battery units.
- The CEO Three Plus controller's variable control modes (time-, pressure-, rate-, and differential-based control) provide flexibility for real-time optimization control.
- Local display allows interaction by the field operator to ensure quick response to changing conditions.
- Simple controls and settings enable easy configuration, thus minimizing the possibility for operator error.
- Standard event logger accurately records plunger cycle time, as well as plunger arrival times, for more accurate operational evaluations.
- Enhanced data-logging capability allows recording of certain events to enable diagnosis of well problems.
- Ultra-low power consumption permits longer run times when using battery power.
- The solar panel extends battery life during daylight hours, reducing operating costs.
- Single integrated NEMA 4 casing design provides protection that allows the unit to operate in harsh, corrosive environments.



Solar-powered supply used for CEO Three Plus to control RapidFlo™ plunger in Barnett shale.



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Specifications

Analog Input Channels	
Number of channels	6, voltage input (1 to 5V or 4 to 20 mA conversion)
Accuracy	0.1% of full scale after factory calibration
Resolution	12 bits
Input	Switched analog voltage to transmitter(s)
Input impedance	2 Meg Ω

Digital Input Channels	
Number of channels	5 digital inputs
Voltage available	3.3V open circuit
Current available	165 μ A short-circuit current
Resistance	Dry contact only, 1K ohm maximum

Digital Output Channels	
Number of channels	8 digital outputs (4 pulsed latch valves)
Rated output	12V maximum, open collector output
Current available	500 mA continuous current
Digital current	2 A pulsed current
End device	Switched battery voltage to end device (solenoid typical)

Communication Ports	
RS-232	Human-machine interface
RS-232	Modbus communication
RS-485	Modbus communication

Power Consumption	
Nominal	360 mW (30 mA at 12V)
Maximum	550 mW

Onboard Memory	
Flash	8 Megabit, 512 K \times 16
Static Ram (SRAM)	8 Megabit, 1 M \times 8



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Options

- For extra-long run time without power, or for SCADA applications, an optional extended-life battery is available.

Certifications

- Weatherford's *CEO* Three Plus plunger-lift controller is CSA Certified, Class 2258-02, Process Control Equipment for Hazardous Locations, Class I, Division 2, Groups A, B, C, and D.