Weatherford®

WellPilot® Deliquification System

Your integrated solution to optimize well production

A single solution with built-in capabilities for multiple wells and multiple types of lift.

Whether your goal is to optimize production from a gas well or enhance oil recovery from a reservoir, it's anything but a simple operation. For example, failing to proactively manage liquid accumulation in a gas well can cause an unintended well kill. Of course, you can program a remote terminal unit (RTU) to automate the deliquification process and help keep your well flowing. But when it comes to many of the other critical procedures involved in maintaining and managing the wells in your field, is your RTU up to task?

The Weatherford WellPilot Deliquification System (DLQ) is much more than a standard RTU. It's like a critical command center for all of your most important production functions, for every well in the field. It's capable, scalable, and ready to simultaneously automate important functions throughout the life of your wells and production facility functions such as electronic flow measurement (EFM), injection-well processes, and custody-transfer-quality measurements.

The WellPilot DLQ is the only RTU on the market that leverages the long Weatherford history of production innovations and unparalleled artificial-lift expertise. For you, that means simplified, multifunctional flow optimization from a single, easy-to-use, cost-effective, and scalable unit.

A custom-configured, scalable solution to meet your needs on demand.

The DLQ delivers remote, real-time control and optimization for one or multiple wells. It continuously monitors well performance and automatically makes adjustments in naturally flowing or artificial-lift systems. Through an integrated approach to production management, the DLQ provides real-time critical measurements, optimization, and control at the wellhead, meter, or production facility.

The WellPilot DLQ includes a low-power, high-performance central processing unit (CPU) and exclusive Weatherford optimization algorithms, and it can easily manage operations and all meter applications for up to 16 wells. It includes integrated input/output (I/O) expansion modules—so that as your production needs grow, you can simply add I/O to expand your capabilities and enhance your control.

The DLQ easily meets your communication, data-storage, and portability needs. It can be readily adapted to a whole range of production configurations and optimization techniques. It interfaces with many third-party field instruments and intelligent devices, as well as wired or wireless networks and various communication protocols. And, for remote applications, it delivers all this high-powered performance with exceptionally low power consumption for solar-powered applications.

The single, powerful controller that manages and optimizes a variety of system applications.

The WellPilot DLQ delivers efficient, reliable performance for a variety of applications and processes:

- **Flowing wells** – Controls multiple wells and applications from a single RTU platform, delivering advanced pressure and flow control.
- **Plunger lift wells** – Offers a broad range of configurations and controls, including time- and pressure-based control, multiple valve configurations, flow-rate and differential-pressure control. Continually monitors tubing, line, and casing pressures, and production-tubing size. Advanced control features include Foss and Gaul, casing sway, and Weatherford AutoAdjust™ cycle control.
- **Gas lift wells** – Uses a multiwell control module to automate many unloading, ramping, and injection-control processes. Supply gas is allocated among common wells, ensuring optimized production. An analysis workbench integrates real-time RTU data with the gas-lift modeling engine to identify inefficient operations and optimize configurations. Well-test validation data is used to ensure models remain current.
- **Injection wells** – Provides remote, real-time control for one or multiple wells, with data collection from up to 24 orifice or V-Cone® meters. Advanced communications support and integrated I/O expansion modules provide exceptional customization options.
- **EFM** (gas or liquids) – Economically delivers precise flow measurements for up to 24 orifice or V-Cone meters. Supports industry-standard calculations and API process methods for accurate collection and reporting of custody-transfer measurements.
- **Multiwell control** – Supports up to 16 wells and multiple well configurations from a single RTU platform. As production needs grow, you can add wells and control various artificial-lift methods simply by adding I/O capacity to the RTU configuration.
- **Well test** – Calculates the amount of gas, oil, and water produced from a single well during the test period. Configurations include local and remote wells, user-selectable scheduling and sequencing, on-demand testing, and interfaces with intelligent field devices such as the Weatherford Red Eye® water cut meter.
- **Facility monitoring** – Supports many third-party sensors, including those that monitor temperatures, pressures, levels, and flow rates. Also includes native-device protocol, Weatherford CIM, and Modbus to support monitoring of intelligent field devices.
- **Intelligent Machine Interface (IMI)** – Supports Windows® operating system, enabling you to easily configure the RTU, modify settings, and extract data—both onsite and from remote locations.

*V-Cone is a registered trademark of McCrometer.
*Windows is a registered trademark of Microsoft Corporation.

Capabilities by well type

Flowing Wells

- Multiple wells and applications from a single RTU platform
- Support for up to 16 wells/control loops
- Multimeter EFM (orifice or V-Cone) support from up to 24 gas or liquid meters
  - AGA 3 and 8 calculations
  - API Chapter 21.1-compliant for custody-transfer-quality gas measurement
- Multiple pneumatic or electric valve control
- Advanced pressure and flow control
- Integrated I/O expansion modules – wired and wireless
- Support for intelligent field devices
- Weatherford PROControl™ functionality with custom alarming and controls
- Production and facility monitoring and control
- Permanent or temporary shutdown
- Four-line LCD with keypad
- Communications support for radio, satellite, cellular digital packet data (CDPD), and Ethernet networks

Injection Wells

- Multiple wells and applications from a single RTU platform
- Support for up to 16 wells
- Multimeter EFM (orifice or V-Cone) support from up to 24 gas or liquid meters
  - AGA 3 and 8 calculations
  - API Chapter 21.1 compliant for custody-transfer-quality gas measurement
- Multiple pneumatic or electric valve control
- Remote, real-time plunger-lift control and optimization for single or multiple wells
- Advanced pressure and flow control
- Permanent or temporary shutdown
- Support for intelligent field devices
- Integrated I/O expansion modules – wired and wireless
- PROControl functionality with custom alarming and controls
- Four-line LCD with keypad
- Communications support for radio, satellite, CDPD, and Ethernet networks

Plunger-Lift Wells

- Critical velocity flow-rate control
- Remote, real-time plunger-lift control and optimization for single or multiple wells
- Production and facility monitoring and control
- Intermittent control
- Permanent or temporary shutdown
- Four-line LCD with keypad
- Multiple pneumatic or electric valve control for single or multiple wells
- Support for intelligent field devices
- PROControl functionality with custom alarming and controls
- Foss and Gaul control module
- Casing sway control module
- Communications support for radio, satellite, CDPD, and Ethernet networks

Gas-Lift Wells

- Production and facility monitoring and control
- Intermittent control
- Permanent or temporary shutdown
- Automated startup and shutdown
- Four-line LCD with keypad
- Multiple pneumatic or electric valve control for single or multiple wells
- Support for intelligent field devices
- PROControl functionality with custom alarming and controls
- 16 independent injection-control loops
- Grouping and prioritization of wells by injection source
- Automated unloading sequence – API and custom
- Communications support for radio, satellite, CDPD, and Ethernet networks

Built-in features that let you customize well performance to your specifications.

The DLQ comes loaded with control and optimization capabilities for common production needs—so you won't have to buy extra, expensive options or invest in complicated programming to get the job done.

PROControl functionality

The fully integrated PROControl package enables you to implement artificial-lift and control schemes without programming. Up to 16 independent control loops support a variety of complex control strategies. All parameters, set points, and control functions can be entered, initiated, and edited locally or remotely with IMI. Calculations, controls, and data storage occur continuously within the RTU.

Off-cycle initiation of flow control

Pioneered by Weatherford, this advanced feature enables the operator to set the minimum flow rate during the after-flow period following plunger arrival. Once this minimum flow rate has been reached, the controller automatically begins the OFF cycle to avoid further liquid loading in the well. This optimization feature is especially valuable in wells where fluctuating line pressures can affect the ability to flow above critical velocities.

Automatic Control Logic™ (ACL) software

Weatherford ACL software enables you to program your own expertise into the unit for applications that require unique specifications that are outside of the standard firmware programming. The unit supports up to 32 ACLs (built around IEC 61131-3 standards for structured text) that can perform various tasks and functions.

Multipurpose interface module (MIM)

The MIM is the standard I/O platform for the WellPilot DLQ system. It can be packaged in the system or deployed separately at the wellhead or other strategic monitoring or control point. As an intelligent networked device, the MIM is perfect for wireless applications where process points are remote from the RTU or where the wellhead is distant from the meter and production facility. This wireless option makes system installation quick and easy with no trenching or permitting required.

Advanced communication options

Pluggable communication modules offer design flexibility in wired and wireless networks for local and long-haul communications. A variety of serial communication options exist to support intelligent field devices.

WellPilot DLQ System Specifications

RTU BOARD

Microprocessor	Low-power CMOS 32-bit ARM @400 MHz
Power consumption	0.65 W
Memory, onboard	64 MB RAM; 256 MB flash
Memory, removable	1 GB secure digital
Power requirements	11.5 to 18.0 VDC

ENCLOSURE SYSTEM

Polycarbonate, NEMA 4 with removable mounting flange	17.0 in. x 15.25 in. x 8.25 in. (h x w x d); Weatherford red
Carbon steel, NEMA 4 with integral mounting flange	17.0 in. x 15.75 in. x 8.0 in. (h x w x d)

COMMUNICATIONS, ONBOARD

1 x RS-232	Local operator station (LOS)
1 x TCP/IP	Host (DACC, MODBUS), local operator station (LOS)
1 x RS-485	Internal network (MIM, MVT)
Protocols	Weatherford DACC, MODBUS RTU

COMMUNICATIONS, OPTIONAL

Comm 1, TTL connector	RS-232/RS-485; host port
Comm 2, TTL connector	RS-232/RS-485; host read only/local device network
Comm 3, TTL connector	RS-232/RS-485; local device network
Protocols	Weatherford DACC and CIM, MODBUS RTU, Tank Level (ROS, Siemens, LevelMaster)

DISPLAY/KEYPAD

Display	4 x 40 character LCD
Keypad	20 key alphanumeric membrane

ENVIRONMENTAL

Temperature	-40° to 158°F (-40° to 70°C)
Temperature, LCD	-4° to 149°F (-20° to 65°C)
Relative humidity, noncondensing	0 to 95%

CERTIFICATIONS

Hazardous locations	CSA Class I, Division 2 Groups C & D

WellPilot® Deliquification System

For more information on how the WellPilot DLQ can enhance production and reduce automation costs in naturally flowing or artificial-lift systems, contact us at **PO-Info@Weatherford.com**, or visit us online at **weatherford.com**.

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