Weatherford Surface System (WSS) Version EA

Weatherford Wireline Acquisition Systems are used to acquire geophysical log data from various series of downhole tools. Depending on the series of tools or sensors used, the data obtained could be from an openhole environment, a cased-hole environment, or production logging. A subset of the cased-hole services is ballistic services, in which an explosive service is used.

Previously, Weatherford used multiple different acquisition systems to record this data. These historic acquisition systems are being replaced by variants of the WSS. Depending on the requirements of the client and region, different versions of the WSS are offered to provide fit-for-purpose solutions.

The variants of the WSS currently available are the WSS-A, WSS-B, WSS-D, and the WSS-E. The initial version of the WSS-E is known as the WSS-EA.

The WSS-EA is a single-conductor-only variant of the WSS consisting of the portable WSS-D mounted into a rack, a shooting panel, and the newly developed Line Test/Line Swap (LTS-BA) panel. The WSS-EA addresses the needs of cased-hole-only units that only require single-core wireline.

The surface hardware, designed to support the recently released cased-hole high-speed telemetry and most traditional cased-hole tools, uses a digital-signal-processing surface-modem panel and the same DC power supply used in other variants of the WSS.

The WSS-EA has two basic operating modes and the ability to switch between two different single-core wirelines. One mode uses the WCM-D modem to communicate with various series of downhole tools. The other mode employs a shooting panel to perform any required ballistic services.

WSS-E rack (no sondex)

Applications

- Provides the surface acquisition from most legacy cased-hole tools used for basic cased-hole applications
- Provides the surface acquisition of the newer ultrasonic radial scanner (URS), casing imaging (CIT), cased reservoir evaluation (CRE), and the universal gamma ray (UGR-K) cased-hole tools for advanced cased-hole applications
- Supports the surface acquisition of the standard openhole tools that do not require additional AC power for openhole evaluation purposes
- Supports the surface acquisition of the new cased-hole high-speed-telemetry interface for advanced cased-hole applications
- Supports the surface acquisition of Compact™ logging on single-conductor wireline (no spontaneous potential (SP) measurement) for both openhole and cased-hole circumstances
- Supports the ability to perform ballistic services with the shooting panel, Weatherford Logging Software (WLS), and WSS firmware

LTS-BA and shooting panel

© 2012–2014 Weatherford. All rights reserved.

Weatherford Surface System (WSS) Version EA

Features, Advantages, and Benefits

WSS-E rack (with sondex)

- The WCM-D modem, used as part of the WSS-EA, has a proven track record in field operations, saving the operator time and money.
- The LTS-BA panel line-selector switch simplifies switching between drums by eliminating the need to route custom cables, increasing efficiency when changing between logging and ballistic operations.
- The external wireline input enables simple patching of third-party equipment directly into the panel mounted inside the unit, avoiding any external connections to the drum.
- LTS-BA galvanometer measurement ensures that any potential detonator problems can be detected in real time, reducing the possibility of a costly ballistic misfire.
- The Hanson potential monitor operates with a 12V input, eliminating the need for internal batteries while increasing safety by avoiding unintentional ballistic misfires.
- By using a single acquisition system, WSS-EA supports most cased-hole tools, as well as URS, CIT, CRE, UGR-K, and standard openhole tools that do not require additional AC power, increasing overall efficiency.
- The WSS-EA supports the new cased-hole high-speed-telemetry interface, providing the ability to run the CRE tool without using the portable WSS-D, increasing efficiency by not requiring system/unit swap.
- Automatic line equalization simplifies the communication setup on different types of wireline, increasing the capability of gathering data in complex wellbores.
- The improved analog casing-collar locator (CCL) response is better able to distinguish collars, improving the quality of casing-collar logs.
- The sector bond tool (SBT) and the slim sector bond tool (SSB) are set up for automatic synchronization with cased-hole sonic tools, increasing efficiency with faster communication setup.
- A low-noise DC power supply, applicable for noise logging (NSE), does not interfere with the noise-logging tool, improving logs from noise tools.
- The high-current (2A) DC power supply enables the motorized cutting tool (MCT) to be run, improving efficiency by not requiring another system to run the MCT.
- Factory-calibrated DC power supply outputs the required DC voltage, saving the cost of potential tool damage from incorrect voltages.
- Pulse signals are set automatically, simplifying communication setup.
- The depth-drive simulator checks the logging tools without engaging the winch, increasing efficiency in testing logging tools.
- Battery-backup capability enables the WCM-D modem to operate on DC power if AC power is lost, increasing overall efficiency in shallow-well perforations.
- WSS-EA supports Compact™ logging on a single-conductor wireline (no SP measurement), eliminating system/unit swap.
- Ballistic services are supported with the shooting panel, WLS, and WSS firmware, and the depth correlations are completed in WLS before using the shooting panel, improving the reliability in ballistic services.
- Shooting panel and LTS-BA combination may be mounted in the rack or near winch controls, increasing operational flexibility for WSS-EA installations.

© 2012–2014 Weatherford. All rights reserved.

Weatherford Surface System (WSS) Version EA

Specifications

Components	Unit Size (H × W × D) (in./mm)	Unit Weight
Cabinet	49.75 × 23 × 33 1263.65 × 584.20 × 838.20	332 lb (150.6 kg)
Rackmount PC (WSN-AU)	3.5 × 19 × 22 88.90 × 482.60 × 558.80	31 lb (14.1 kg)
Potential monitor (HPM-AD)	1.75 × 19 × 13 44.45 × 482.60 × 330.30	12 lb (5.4 kg)
DC power supply (SRS-DA)	1.75 × 19 × 20 44.45 × 482.60 × 508.00	20 lb (9.1 kg)
Surface-modem panel (WCM-D)	5.25 × 19 × 22 113.35 × 482.60 × 558.80	24 lb (10.9 kg)
Plotter (PLT-EC)	4.5 × 12.2 × 12.4 114.30 × 309.88 × 314.96	14 lb (6.4 kg)
Line-test switch panel (LTS-BA)	3.5 × 19 × 14 88.90 × 482.60 × 355.60	5 lb (2.3 kg)
Shooting panel (HSP-AA)	3.5 × 19 × 19 88.90 × 482.60 × 482.60	15 lb (6.8kg)
Power distribution unit (PDU-D)	4.5 × 5.9 × 1.4 114.30 × 149.86 × 35.56	5 lb (2.3 kg)
Ethernet hub	1.4 × 5.9 × 4.5 35.56 × 149.86 × 114.30	1 lb (0.5 kg)

System Panel Description

Workstation is a rack-mounted computer that hosts the acquisition software controlling downhole tools, and is responsible for acquiring, processing, and routing data for output to the monitor, plotter, hard drive, or satellite.

Potential monitor (HPM-DA) provides continuous stray-voltage, ground-integrity, and radio-frequency (RF) monitoring during well perforation.

Ethernet hub routes network communication both within and outside the WSS-EA.

DC power supply (SRS-DA) is monitored and controlled by WCM-D panel and acquisition software and provides up to 600V/2A DC power with lower electrical noise than power supplies previously available.

Surface-modem panel (WCM-D) is a digital-signal-processing surface modem that processes cased-hole high-speed telemetry, analog, pulse, digital, sonic, and Compact™ openhole data. The WCM-D also provides automatic wireline-signal equalization, tool gains, sonic synchronization, and pulse discrimination to ensure proper communication between the data acquisition system and downhole tools via a single-conductor cable.

Plotter displays log data processed by the acquisition system.

Power distribution unit (PDU-D) receives primary AC power and supplies it to the various panels in the WSS-EA.

Shooting panel provides the voltage and current necessary to fire downhole detonators.

LTS-BA panel enables the selection between two different monocore lines and allows for an external input.

© 2012–2014 Weatherford. All rights reserved.

Weatherford products and services are subject to the Company's standard terms and conditions, available on request or at weatherford.com. For more information contact an authorized Weatherford representative. Unless noted otherwise, trademarks and service marks herein are the property of Weatherford and may be registered in the United States and/or other countries. Weatherford products named herein may be protected by one or more U.S. and/or foreign patents. Specifications are subject to change without notice. Weatherford sells its products and services in accordance with the terms and conditions set forth in the applicable contract between Weatherford and the client.