

Log I/O

High performance programming library for well logs

APPLICATIONS

- Any drilling & well application/service
- Data management software
- Well log format conversion
- Well log file validation
- Interfacing existing software/service and WITSML servers
- Interfacing existing software/service and corporate ER databases
- Converting well log data to Excel or HTML
- Extract valuable metadata
- Cloud service ingestion

FEATURES

- Java 8+ version supports: DLIS, LIS, LAS 2.0, LAS 3.0, BIT, SPWLA, GCNPD95, JSON and ASC
- .NET standard 2.0 version supports: DLIS, LIS, LAS 2.0, LAS 3.0 and BIT
- In progress: SPWLA, GC-NPD-95, JSON and ASC
- Read/write support for all supported formats
- Streaming support for all supported formats

BENEFITS

- High performance, small footprint
- Simple and well documented API
- Easy to integrate
- No external dependencies
- Thread-safe
- Online tutorials and documentation

The challenge

Most well log and drilling data of today is trapped within disk files of ancient and hard to access data formats like DLIS, LAS, LIS, BIT and SPWLA.

These formats represent orphaned technologies and are outdated. Their syntax is overly complex, convoluted, and awkward. Available support software is limited, and software tools are rare. Documentation is poor to nonexistent.

Still, these are the main storage and communication media for wellbore logging information today. The amount of data is huge and growing. As is the aggregate cost of maintaining and utilizing this information.

This must change.

Why Log I/O?

Log I/O* is a programming library capable of consuming well log data from all formats mentioned above. It is designed to fit into any modern software application. With a minimum of programming effort, it can handle all low-level well data access in your software.

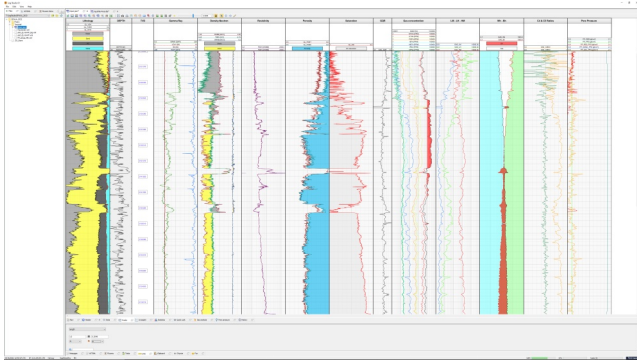
Log I/O is the ideal starting point for revitalizing your well log information. When building data management solutions or technical E&P software/services. Log I/O is simple yet complete, robust, efficient and reliable.

Log I/O is the steppingstone between the past and the future of well logging information management.



Plugging Log I/O into your software/services, enables immediate access to all types of log data files and gives instant ability to analyze, process and convert the data.

Log I/O



Log Studio showing WITSML live log plots.

DEPTH m	DENSITY g/cm ³	ABSORPTION g/cm ²	ACTIVITY %	APPENDIX %	ATACSIEN bar	BGRPH g/cm ³	BGRPH %	RESISTIN m	RESISTIN bar	
9104	2469.3	2.1398	2.4008	1.3779	426.4512	266.5000	2.400000	0.0	8.5	471.5944
9105	2469.4	2.1374	2.3864	1.3779	426.4512	267.2000	2.400000	0.0	8.5	471.6230
9106	2469.5	2.1330	2.3712	1.3781	426.5204	268.0000	2.382000	0.0	8.5	471.6633
9107	2469.6	2.1281	2.3560	1.3775	426.5571	268.0000	2.364000	0.0	8.5	471.6951
9108	2469.7	2.1238	2.3404	1.3775	426.5866	268.0000	2.360000	0.0	8.5	471.7290
9109	2469.8	2.1202	2.3244	1.3776	426.6122	0.7912	2.400000	0.0	8.5	471.7631
9110	2469.9	2.1161	2.3082	1.3779	426.6248	158.6400	2.400000	0.0	8.5	471.7983
9111	2470.0	2.1124	2.2919	1.3774	426.5888	268.5000	2.404000	0.0	8.5	471.8346
9112	2470.1	2.1088	2.2757	1.3782	426.5460	159.0000	2.400000	0.0	8.5	471.8720
9113	2470.2	2.1052	2.2593	1.3771	426.5107	1.0309	2.514000	0.0	8.5	471.9106
9114	2470.3	2.1018	2.2429	1.3769	426.4980	0.6207	2.610000	0.0	8.5	471.9504
9115	2470.4	2.1002	2.1948	1.3683	427.1302	7.0222	2.400000	0.0	8.5	472.0000
9116	2470.5	2.1008	2.1678	1.3787	426.8720	7.1220	2.420000	0.0	8.5	472.0504
9117	2470.6	2.1009	2.1396	1.3793	426.6512	0.4844	2.300000	0.0	8.5	472.0996
9118	2470.7	2.1008	2.1088	1.3772	426.4512	0.1051	2.302000	0.0	8.5	472.1510
9119	2470.8	2.1008	2.1009	1.3761	426.1000	0.7009	2.340000	0.0	8.5	472.1733
9120	2470.9	2.1000	2.1007	1.3761	426.0200	1.2445	2.370000	0.0	8.5	472.2011
9121	2471.0	2.1020	2.1020	1.3768	426.1400	1.0202	2.380000	0.0	8.5	471.2688
9122	2471.1	2.1014	2.1014	1.3764	426.1400	0.0200	2.380000	0.0	8.5	471.3214
9123	2471.2	2.1020	2.1020	1.3764	426.1207	0.0100	2.380000	0.0	8.5	471.3760
9124	2471.3	2.1040	2.1041	1.3699	426.1100	0.0700	2.380000	0.0	8.5	469.8047
9125	2471.4	2.1033	2.1042	1.3633	422.1207	1.0100	2.380000	0.0	8.5	468.4683
9126	2471.5	2.1033	2.1028	1.3639	423.0320	0.0800	2.380000	0.0	8.5	468.3811
9127	2471.6	2.1000	2.1014	1.3607	423.6600	0.0000	2.420000	0.0	8.5	468.3070
9128	2471.7	2.1000	2.1000	1.3602	423.3800	0.0000	2.410000	0.0	8.5	468.2332
9129	2471.8	2.1110	2.1077	1.3592	423.7400	0.0000	2.410000	0.0	8.5	468.7006
9130	2471.9	2.1002	2.1079	1.3611	423.9811	0.0000	2.410000	0.0	8.5	468.2096
9131	2472.0	2.1000	2.1028	1.3533	425.0572	0.0000	2.400000	0.0	8.5	465.9559

Log Studio showing WITSML tabular data in a live stream.

Background

The Digital Log Interchange Standard (DLIS) was introduced as Recommended Practice 66 (RP 66) by the American Petroleum Institute (API) in 1991. DLIS is a dense binary, IEEE big-endian data format.

Log Interchange Standard (LIS) is the predecessor of DLIS and was developed by Schlumberger in the late 1970's. LIS is based on the VAX binary information standard.

The Log ASCII Standard (LAS) was created by the Canadian Well Logging Society (CWLS) in the late 1980s. LAS is an ASCII text format with a simple syntax, with high verbosity.

The Basic Information Tape (BIT) is a binary well log format created by Dresser Atlas in in the 1970's. BIT is a binary format based on the IBM System/360 representation.

SPWLA is an ASCII or EBCDIC text format for core log data. It was developed by the Aberdeen Well Log Analysis Society (a chapter of the Society of Petrophysicists and Well Log Analysts) in 1985.

Log I/O supports all the above formats with a convenient, well documented and minimal API. Both reading and writing is supported so that clients can easily build conversion code between the formats and to/from any other well data source.

Log Studio™

Log Studio* is the Petroware reference implementation for well log technologies. The platform holds a rich set of functionalities for working with digital well logs, WITSML and related E&P data.

Virtually all well logging data from the Norwegian continental shelf are quality checked (QC) using Log Studio. Log I/O is one of the underlying technologies used in Log Studio and is extensively tested.

Petroware AS

Sjøhagen 3
N-4016 Stavanger
Norway

E-mail: info@petroware.no