



**DRILL-LAB**

| Surface Logging

Drill-Lab

Rig instrumentation





About us

Rig instrumentation

General information

Heart of the system

Sensors and equipment

State-of-the-art software

System configurations & schematics

EasyRIG

SPR

Coiled Tubing

Our Clients



# About us

## Company overview

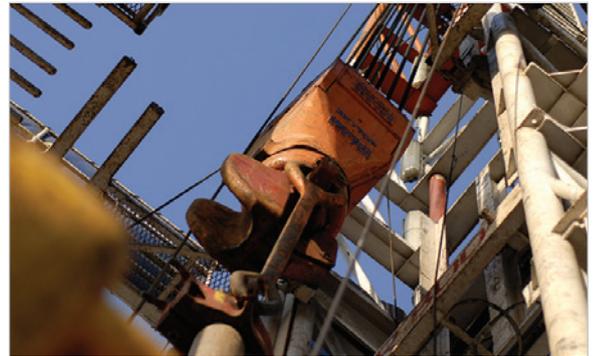
Drill-Lab has been providing geological consulting and professional surface logging services to customers world-wide since 1990. From advanced gas evaluation and drilling instrumentation, through to computerized mud logging services, real time data transmission and data centres as well as geological consulting, the company offers an integrated portfolio of surface logging services covering all types of advanced drilling projects.

The monitoring equipment allows us to acquire and provide to the client a detailed picture of what is happening in the well and in the drilling fluids circulating system, while an experienced mud logger makes the necessary detailed description and conducts the testing of drilled cuttings and cores in order to aid the well site geologist in assessing the hydrocarbon potential of each formation.

Drill-Lab's custom-developed software is a highly advanced expert system and interactive environment for real-time data acquisition, visualization, calculation, monitoring, recording, analysis and storage in the drilling and surface logging industry. In combination with a satellite Internet connection, the software can be a great tool for specialists working at distant locations, including qualified engineers, who monitor drilling parameters, as well as the management, planning and analysing the project.

Quality, reliability and innovation of Drill-Lab's services are achieved by extensive experience of the company's management team and staff.

Our main goal, reflected in the Integrated Management System certified by TÜV Rheinland in accordance with the standards ISO 9001 and 14001, as well as BS OHSAS 18001, has been to maintain the highest ethical and professional standards by prioritizing the interests of our clients, people and the environment.



# Rig instrumentation

## General information

At the beginning of the 2000s, making use of the long term experience of its technical staff, Drill-Lab launched development, production and sale of state-of-the-art rig-site monitoring and recording systems.

Since then our engineers and programmers have created newer and more perfect editions of the systems, which include high precision sensors, an advanced data acquisition system and custom-developed software, as well as other equipment used in the oil & gas and surface logging industry.

We focus our production on companies and rig contractors that want to increase the standard of any of their rigs which are not provided with digital rig instrumentation systems or use outdated applications. We also target contractors who wish to recuperate previously withdrawn and presently incomplete drilling rigs.

The application of new technology, certified materials, precision sensors, as well as careful and durable manufacture, has created a safe, reliable and modern system that has been sold in great numbers to customers all over the world, giving them a head start on its competitors, as well as every advantage possible and their very best chance at success.

Our Rig instrumentation systems are of a modular structure and can be easily adapted to client and project unique requirements. Drill-Lab offers its clients three typical configurations of the systems that can be customized, i.e. EasyRig - mounted on oil & gas drilling rigs, SPR - a mobile system adapted for fast rig-up and rig-down even on rigs of small dimensions and for short-term works, as well as a system installed on Coiled Tubing drilling units.

Felxibility of our systems will satisfy even the most demanding clients.



Year	System type	Client	Qty
2005	Coiled Tubing	PN Diament, Poland	1
2006	EasyRig	PN Diament, Poland	1
2008	EasyRig	PNiG Nafta, Poland	1
2009	EasyRig	PNiG Nafta, Poland	1
2010	EasyRig	PNiG Nafta, Poland	3
2012	EasyRig	Astra Star, Kazakhstan	3
2012	EasyRig	PN Diament, Poland	1
2013	EasyRig	Exalo Drilling, Poland	1
2014	EasyRig	Exalo Drilling, Poland	1
2015	EasyRig	Exalo Drilling, Poland	1

Systems sale  
Drill-Lab systems sale over the years 2005-2015

# Rig instrumentation

## Heart of the system

A stable and reliable data acquisition system is the “heart” and critical element of the operation of nearly all drilling related projects.

The Drill-Lab data acquisition system (DL-DAS) is a combination of the latest technology and the original solutions derived from our many years’ experience in the business.

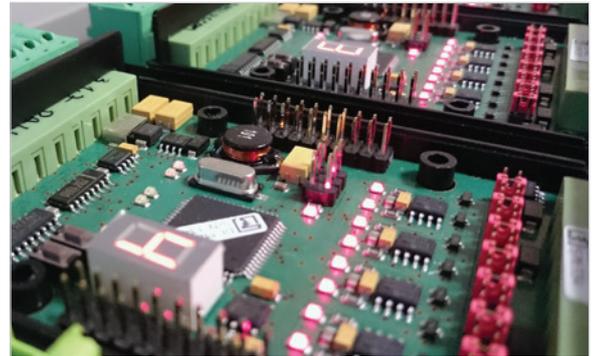
Through its modular and flexible design, DL-DAS can be easily customized and adapted to the client and project specific demands and therefore it is used as a basis of all types of our rig instrumentation systems.

Apart from the obvious differences in the technical configuration of the system, also the enclosure of our DL-DAS is often the key element that is individually adjusted to the unique challenges of the projects.

Thanks to high-frequency and precise data acquisition, DL-DAS greatly improves efficiency and safety of the drilling operations, as well as decision making at every stage of the project.

## Highlights

- High-frequency and precise data processing from up to 60 sensors at 5 Hz acquisition frequency.
- Stainless and durable construction combined with solid workmanship and advanced technology.
- Fast assembly or replacement of its components as well as expansion of its monitoring capabilities thanks to the modular and scalable structure.
- Possibility of application on various types of drilling rigs within different drilling related projects.
- Easy calibration of connected sensors thanks to dedicated calibration software.
- Variety of available enclosures designed for unique and special client requests, e.g. 19” rack housing, control cabinet, as well as ATEX certified enclosure.



## Technical specifications

Dimensions (HxDxW)	440 mm x 220 mm x 500 mm (for a 19” rack housing)
Weight	approximately 14.5 kg (for a 19” rack housing)
Power	100-240 V AC 50-60Hz 90-350 V DC
Operating temperature	-15° C - +45° C
Humidity	95%
Acquisition frequency	up to 5 Hz
Analog signals input	0-5 V or 4-20 mA 50 Hz/48 inputs (expandable as per client request) 12-bit AD conversion
Digital signals input	up to 200 kHz/12 inputs (expandable as per client request) WITS O input module Modbus TCP/IP
Gas inputs	direct input from different types of total gas/hydrocarbon analyzers
Data exchange	through DL-MVR software via a TCP/IP server
Analog output	4-channel analog output selectable current (0-20 mA, 4-20 mA) or voltage output (0-5 V, ±5 V, 0-10 V, ±10 V)
External alarm module	24 V, alarm sirens and signal lights
Certification	CE, ATEX (depending on the housing)

**DL-DAS in numbers**  
DL-DAS technical specification

# Rig instrumentation

## Sensors and equipment

The key elements of Drill-Lab rig instrumentation systems are definitely sensors and additional equipment, e.g. remote computers, drillers' monitors, Ex-proof audio-visual alarms, and many others (according to the client request).

The application of certified materials and sensors conformant with the European directive ATEX permits our system to operate in explosion hazard zones.

Our precise sensors measure mechanical, hydraulic and engineering parameters during each drilling-related operation, providing the basis for further parameter calculations and data visualization.

Electrical circuits and cables in the ex-zone are protected against sparks by installation of intrinsically safe barriers or separators.

Stainless and durable materials used in manufacture and solid workmanship enable the equipment to operate faultlessly in difficult conditions. Our sensors are supplied with standard 24 V power and the output signals are in the range of 0-5 V or 4-20 mA.

Correct installation and calibration of the sensor is easy and compatible with common equipment standards used in the industry. Ergonomic clamps and certified connectors allow sensor installation on any part of the rig, greatly reducing time required for rig-up and rig-down.

## Highlights

- A variety of sensors and additional equipment to choose from and satisfy any specific needs.
- Safer operating environment and peace of mind with ATEX and CE certifications.
- Faultless and reliable operation in difficult conditions thanks to application of appropriate and premium materials.
- Easy installation and calibration with innovative solutions such as quick couplings and ergonomic clamps.
- Variety of types and configurations of the equipment that will fit even the most difficult and demanding surroundings.



## No. Name of the equipment

1	DL-DAS (Drill-Lab's Data Acquisition System)
2	Driller's remote colour screen (DL-Online software installed)
3	Tool pusher's remote computer (DL-Online software installed)
4	Hook load sensor
5	Rotary per minute sensor
6	Rotary torque sensor
7	Return Mud Flow sensor (paddle type)
8	Pump pressure sensor
9	Casing pressure sensor
10	Total Gas measurement
11	LEL sensor
12	H <sub>2</sub> S sensor
13	Switch assembly for Pump Stroke sensor
14	Pit level sensor
15	Ex-proof Audio-Visual Alarm assembly
16	Uninterruptible power supply
17	Set of intrinsically safe barriers
18	and others (according to the client request)

## Sensors and equipment

Sensors and equipment available in Drill-Lab system

# Rig instrumentation

## State-of-the-art software

DL-MVR (Drill-Lab's Monitoring, Visualization and Recording) software is a highly advanced, fully MS Windows operated expert system and interactive environment for real-time data acquisition, visualization, calculation, monitoring, recording, analysis and data storage in the drilling and mudlogging industry.

DL-MVR is dedicated specifically to DL-DAS (Drill-Lab's Data Acquisition System), but it can be adapted to cooperate with other equipment and software.

The user has at his/her disposal two graphical (Gauges and Charts) and one numeric (Numeric Database) module. A user friendly and intuitive interface allows the user to simultaneously observe all three modules or easily switch between them.

The Gauges module displays temporary data as legible digital, analog, level or chart counters.

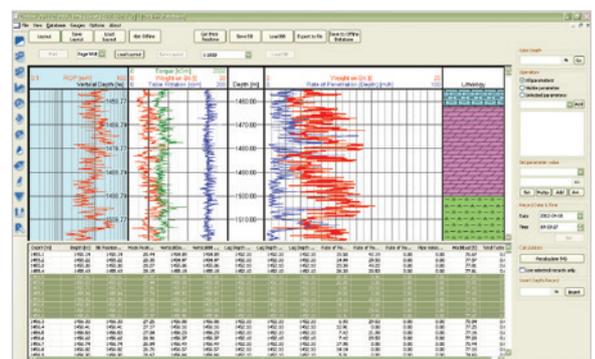
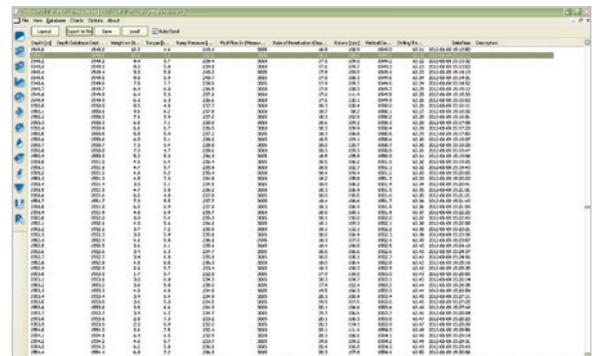
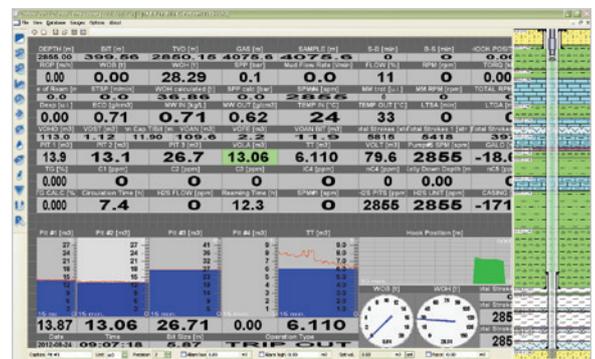
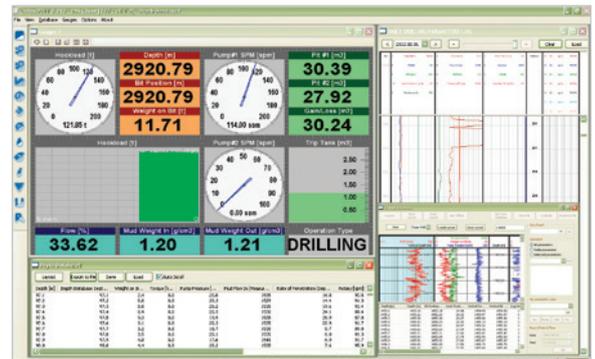
The Chart module allows drawing a chart for any measured parameter for a given work day. A printing option is also available, which allows putting on paper any work day in any time scale.

The Database module allows reading the database in digital form. Thanks to the export option the user can quickly convert the data into a CSV format.

DL-MVR can operate in client/server mode, transferring its data over the Internet to distant (and/or local) locations.

## Highlights

- User friendly and intuitive interface.
- The Charts module helps to follow up trends of each measured/calculated parameter.
- Professional inspection through alphanumeric database.
- Comments added in the Charts and Database module are sent out to all client applications.
- Operation in various unit systems (API, US standard, Canadian, SI Metric, Custom Units).
- Ease of parameter feature edit thanks to a parameter properties dialog.
- Simple access to archive data in the Database and Charts modules.
- Remote overseeing, monitoring and real-time analysis of drilling operations to avoid safety and environmental hazards such as lost circulation, kicks and blow-outs thanks to data transfer to distant locations and client/server architecture.

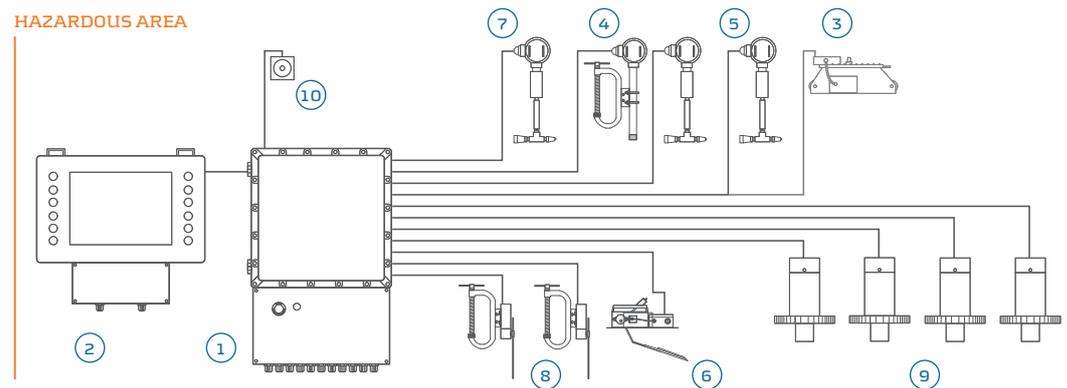


# System configurations & schematics

## EasyRiG

Drill-Lab's EasyRiG system allows continuous monitoring and gathering of technological parameters of the entire drilling process. The system is intended for and installed on oil & gas drilling rigs.

A variety of available enclosures of the system's DLDAS unit (including ATEX certified enclosures and a control cabinet) allows it to be installed in the dog-house or in the control room.



**Schematic 1**  
Schematic of EasyRiG system level I standard



No.	Name of the element	Qty
1	DL-DAS in rack assembly	1
2	Driller's remote colour screen	1
3	Hook load sensor	1
4	Rotary per minute sensor	1
5	Rotary torque sensor	1
6	Return Mud Flow sensor (paddle type)	1
7	Pump pressure sensor	1
8	Switch assembly for Pump Stroke sensor	2
9	Pit level sensor	4
10	Ex-proof Audio-Visual Alarm assembly	1
	UPS (uninterruptible power supply)	1
	Set of intrinsically safe barriers	1

**EasyRiG system**  
Elements of EasyRiG system level I standard

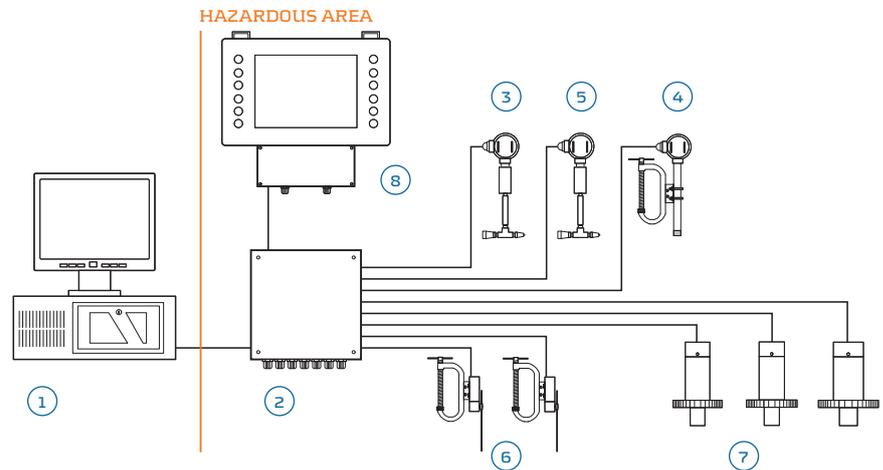
Custom-made level II standard is extended with Casing pressure sensor, Tool pusher's remote computer, Total Gas measurement. The number of each sensor can be adapted as per clients requirements.



# System configurations & schematics

## SPR

Compact, mobile systems called SPRs are installed on work-over rigs. The small size of the system's DL-DAS unit allows it to be installed in the Drilling Supervisor office on location.



**Schematic 2**

Schematic of SPR system level I standard



No.	Name of the element	Qty
1	DL-DAS	1
2	Junction box	1
3	Hook load sensor	1
4	Rotary per minute sensor	1
5	Pump pressure sensor	1
6	Switch assembly for Pump Stroke sensor	2
7	Pit level sensor	3
8	Driller's remote colour screen	1
	Computer PC (in Tool Pusher's office)	1
	UPS (uninterruptible power supply)	1
	Set of intrinsically safe barriers	1

**SPR system**

Elements of SPR system level I standard

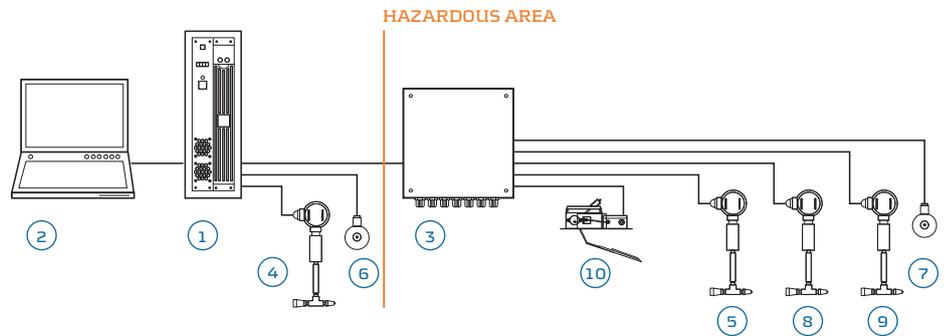
At customer request, Drill-Lab can reconfigure the system on rig site without any extra manufacturing work.

Drill-Lab offers level II standard with additional Rotary torque sensor, Casing pressure sensor and Return Mud Flow sensor (paddle type).

# System configurations & schematics

## Coiled Tubing

Our rig instrumentation system can also be adapted to and improve effectiveness of Coiled Tubing interventions.



**Schematic 3**

Schematic of Coiled Tubing system level I standard



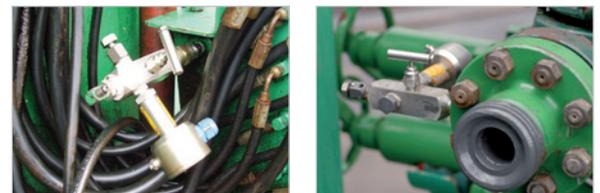
No.	Name of the element	Qty
1	DL-DAS	1
2	Operator remote colour screen	1
3	Junction box	1
4	Pressure sensor	1
5	Head pressure sensor	1
6	Depth A sensor	1
7	Depth B sensor	1
8	Hook load sensor (+)	1
9	Hook load sensor (-)	1
10	Flow meter (measurement signal taken from rig sensor)	1
	UPS (uninterruptible power supply)	1
	Set of intrinsically safe barriers	1

### Coiled Tubing system

Elements of Coiled Tubing system level I standard

Coiled Tubing instrumentation is expandable any time as per client request. Modern hardware allows additional sensors to be easily incorporated into the system.

Level II standard is expanded with additional PVT level sensors and Switch assembly for strokes per minute sensors.



# Our clients

## Everywhere with you

Drill-Lab's core market is in Poland and central Europe; however, the company has also gained worldwide experience in providing services on three other continents. In central Asia, services have been provided since 2000 through our subsidiary based in Kazakhstan. In the Middle East, we are present in Oman, Iraq and Saudi Arabia. Drill-Lab also has seven years of operational experience in Latin America and three years in Africa (Uganda).



### Europe

Apache Poland  
Aurelian Oil & Gas Poland  
Czech Oil Company  
Eni  
FX Energy Poland  
KGHM Polska Miedz  
LAMA GAS & OIL  
NIS Gazprom Neft  
Oil & Gas Development  
OMV  
Lotos Petrobaltic  
PGNIG  
TEXACO

### Turkey

Amity Oil  
Antares Energy  
Çalik Enerji  
Hema Endustri  
Merty Energy

### South America

Alberta Energy  
CMS  
Harken  
Hocol  
Kerr McGee  
Lagoven  
Maple  
Mojave  
PDVSA  
Perenco  
Petroecuador  
Repsol  
TEXACO

### Africa

Heritage Oil & Gas  
Tullow Uganda Operations  
TOTAL E&P Uganda

### Middle East

Gulfstream Resources  
MB Petroleum Services  
Petrogas

### Central Asia

Adai Petroleum  
EmbaYugNeft  
FIOC  
Galaz & Company  
Hurricane Kumkol Munai  
KazakhOil Aktobe  
Kazgermunai  
Kolzhan  
Kulandy Energy corporation  
Maersk Oil Kazakhstan  
Marsel Petroleum

### Central Asia cont.

Nord Imperial  
Orient Petroleum  
Orient Petroleum Central Asia  
Petrokazakhstan Kumkol Resources  
Petrokazakhstan Ventures International  
Petrom  
Sagiz Petroleum  
Sagizpetroleum  
Samek Development  
Samek International  
SevKazGra  
South Oil  
Syrdariamunai  
TEXACO North Buzachi  
Ural Oil & Gas  
Zhaikmunai



**Drill-Lab Sp. z o.o.**  
Krośnieńska 7  
65-625 Zielona Góra  
Poland

phone: +48 68 3238454  
fax: +48 68 3238453  
e-mail: [office@drill-lab.com.pl](mailto:office@drill-lab.com.pl)  
www: [www.drill-lab.com.pl](http://www.drill-lab.com.pl)

**Drill-Lab Kazakhstan LLC**  
Nakhimov 39  
050040 Almaty  
Republic of Kazakhstan

Rev: 10/03/2017

