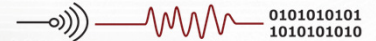


# Technology and Applications

August 29, 2013

**PetroDAQ**



Universal Data Acquisition

Instrumentation

Data Acquisition

Transmission

Monitoring

# PetroDAQ Inc

PetroDAQ Inc is a technology provider of hardware and software to the Oil & Gas industry.

We develop and manufacture leading-edge technology products for faster and informed decisions leading to a more efficient drilling operation.

# Technology highlights

Strong promotion of Industry Standards including WITSML and OPC

High Resolution Measurements

Analog and Digital Sensors



# Product Lines

## By Type

Rig Surface Sensors

Instrumentation and Data Acquisition

Aggregation Hardware and Software

Rig and Web Visualization Tools

Data Historians – Rig & Office

## By Specialty

Drilling

MWD

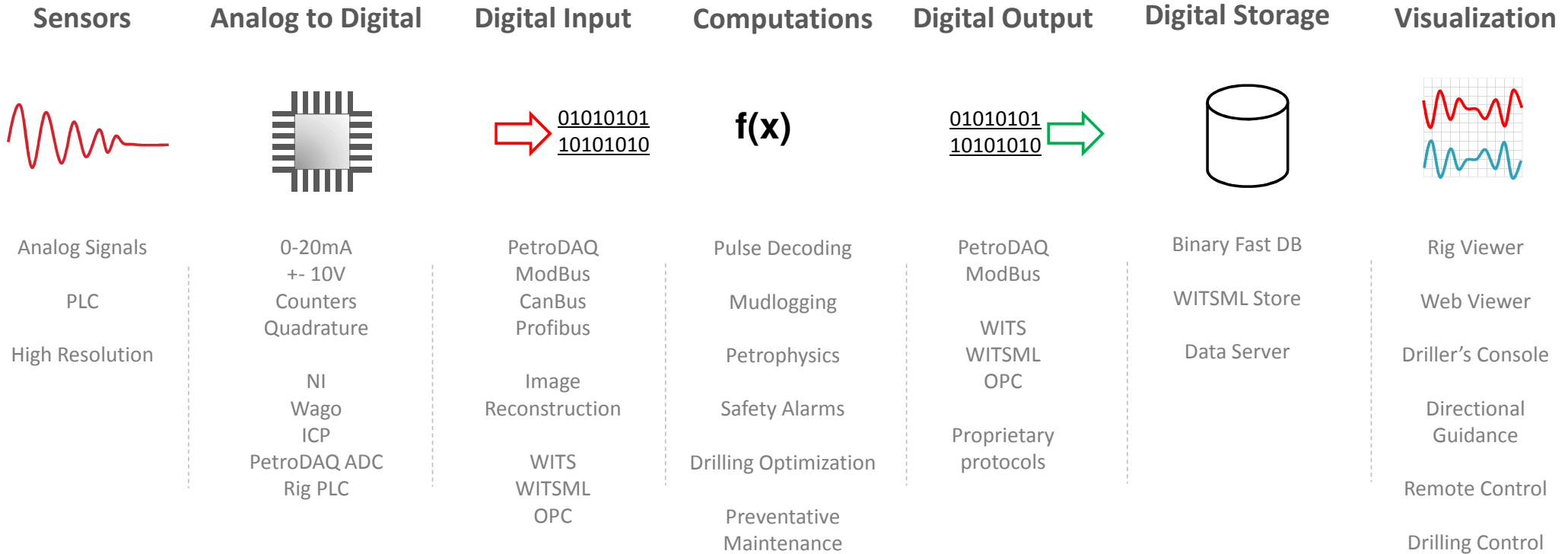
Support Equipment Performance  
Monitoring

Frac'ing

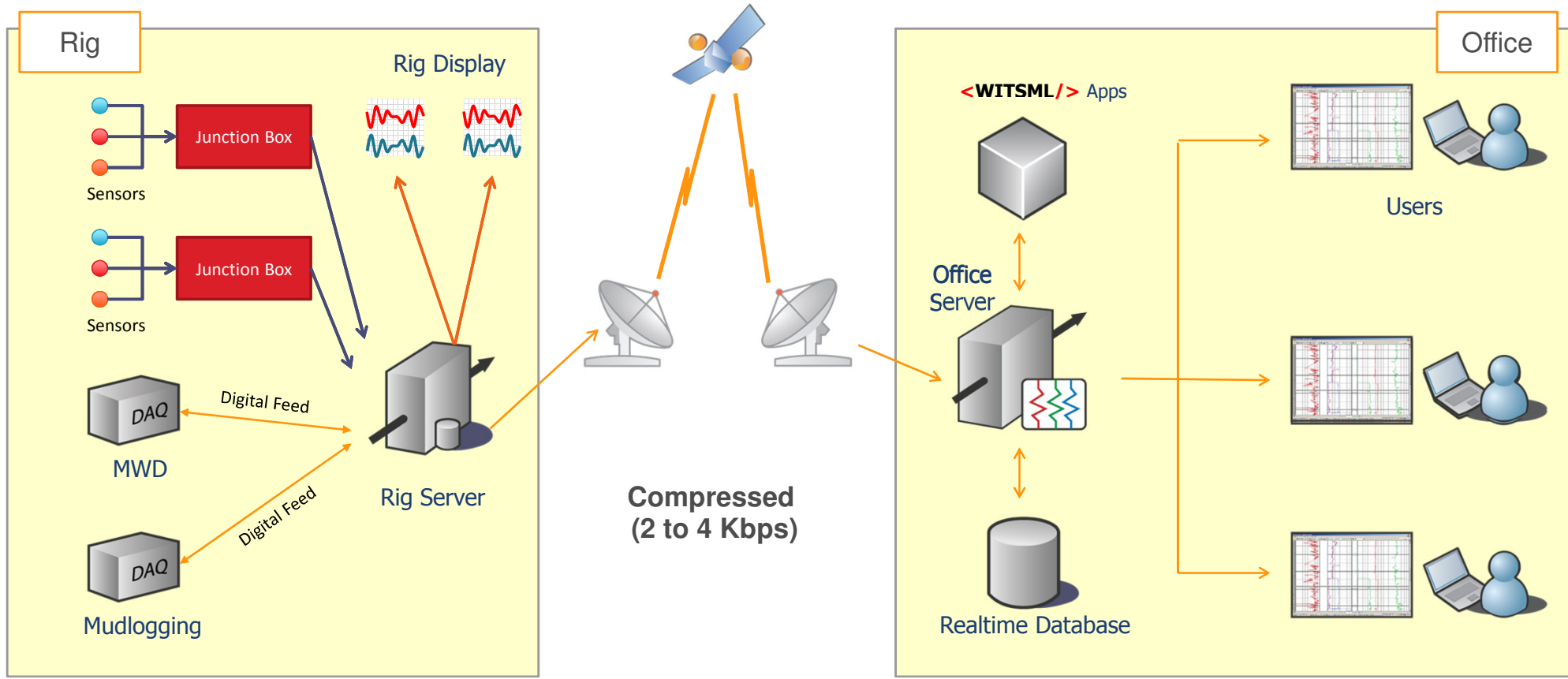
Data Delivery to Central Databases



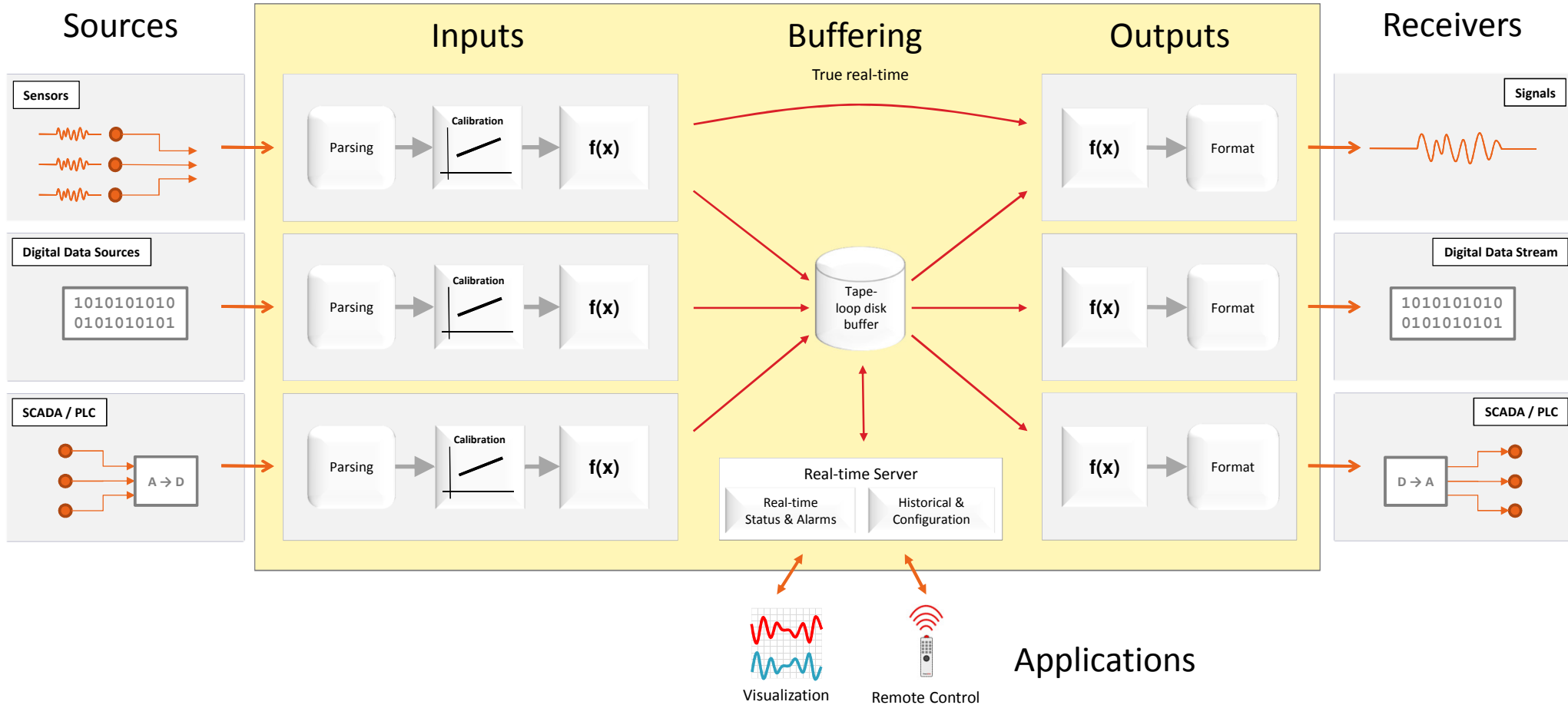
# Components of PetroDAQ Solutions



# Dataflow



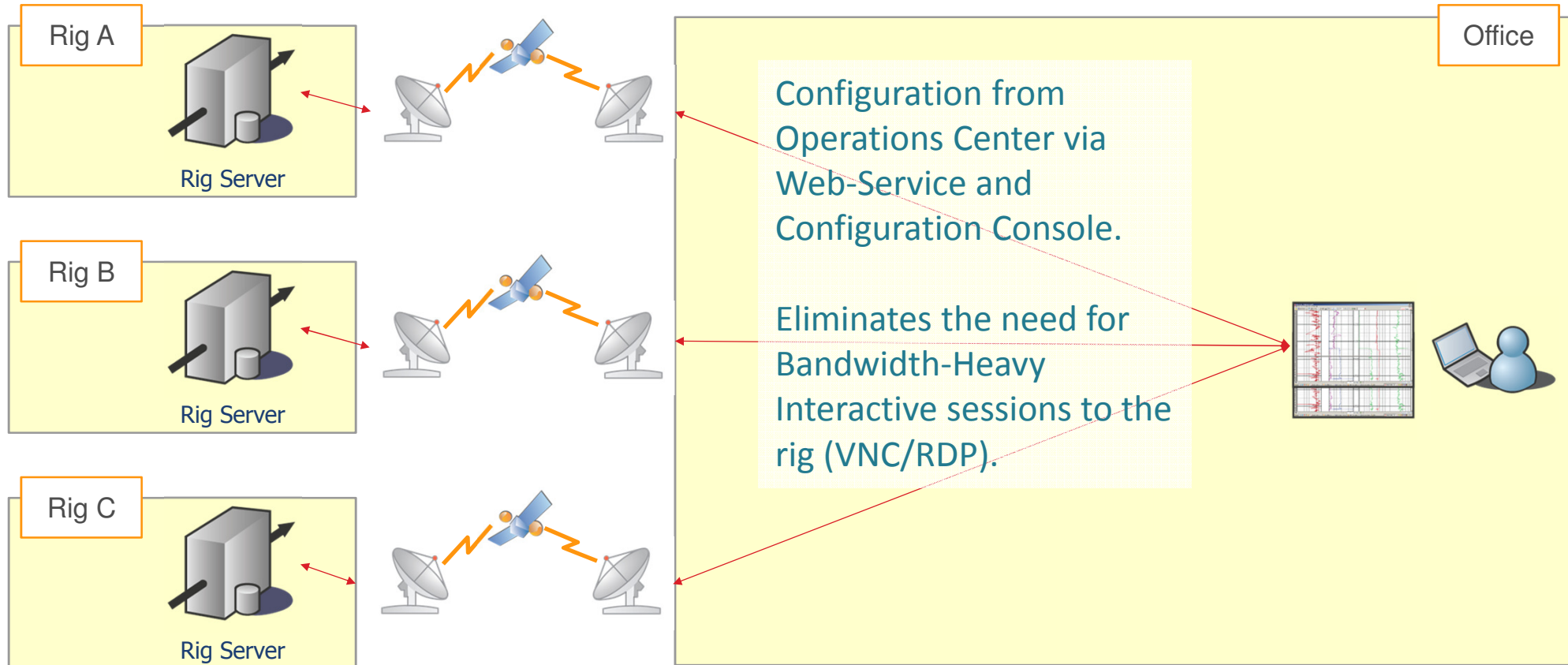
# PetroDAS - Data Acquisition & Aggregation



# PetroDAS - Supported Transports and Protocols

Transport	Input	Output	Protocol	Input	Output
Serial RS-232	•	•	WITS Level 0 Standard and Contractor Specific	•	•
Serial RS-485	•	•	WITSML standard and “Flavors”	•	•
Serial RS-422	•	•	OPC-DA and HDA	•	•
TCP/IP Client	•	•	Modbus RTU, TCP/IP, and Serial over IP	•	•
TCP/IP Server	•	•	National Instruments	•	•
Disk File	•	•	Fracpro	•	•
Wireless	•	•	MWD Teledrill Pulse Decoding	•	
			Azonix ADU Directional Console		•
			Wise		•
			L3-COM HVR with optimized PetroDAQ Storage	•	•
			ICPCON	•	

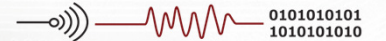
# PetroDAS - Remote Configuration



# Technology and Applications

## Sensors, DAQ, and Aggregation Units

**PetroDAQ**



Universal Data Acquisition

Instrumentation

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Monitoring

# Sensors

All standard surface sensors:

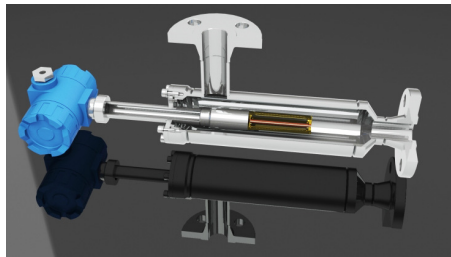
- Pressure (Standpipe, Cement Lines, BOP Stacks)
- Proximity (Strokes / RPM)
- Temperature
- Level (Ultrasonic / Radar)
- Hookload
- Encoders (Block Position / Depth Tracking)
- Crown Block Depth Tracker
- Accelerometer

# Specialty Sensors

No Moving Parts



Density Viscosity Temperature

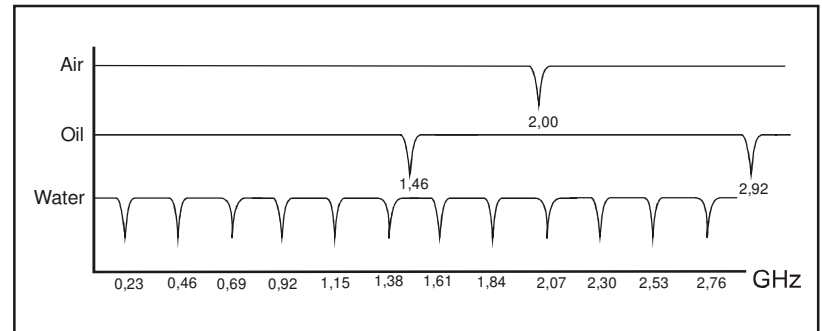
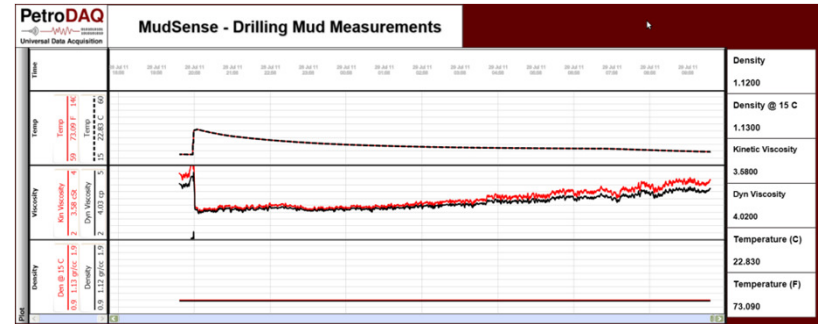


OWC / Salinity

Continuous Measurements



Oil and Water based Muds



# Portable Performance Monitoring

## BOP Testing

- Portable and Fixed-Mount
- Digital readings replace Circular Charts

## Power Monitoring

- Rig Power Quality
- Generator Performance
- Power Consumption



# Electronic Data Recorder

- 42 Channels – Rack Mounted
- Built-in Aggregation Server
- IS Barriers
- Rack Mountable
- Mudlogging, Unmanned Mudlogging and General Rig Instrumentation



# Intelligent Appliance

Single purpose device

Specialized format conversion

Contractor specific protocols

Drop-in upgrade for legacy systems

Remotely configurable



# Rig Aggregator

- Wired & Wireless Digital Data
- Extensive I/O Ports
- Field grade construction
- Data Aggregation & Visualization



# Secure Rig Server

- All the functionality of the Rig Aggregator
- High-performance
- Extensive I/O Ports
- Built-in Cisco Router for VLANs
- Rack-Mountable
- Data Center in a box – transportable in Helicopters

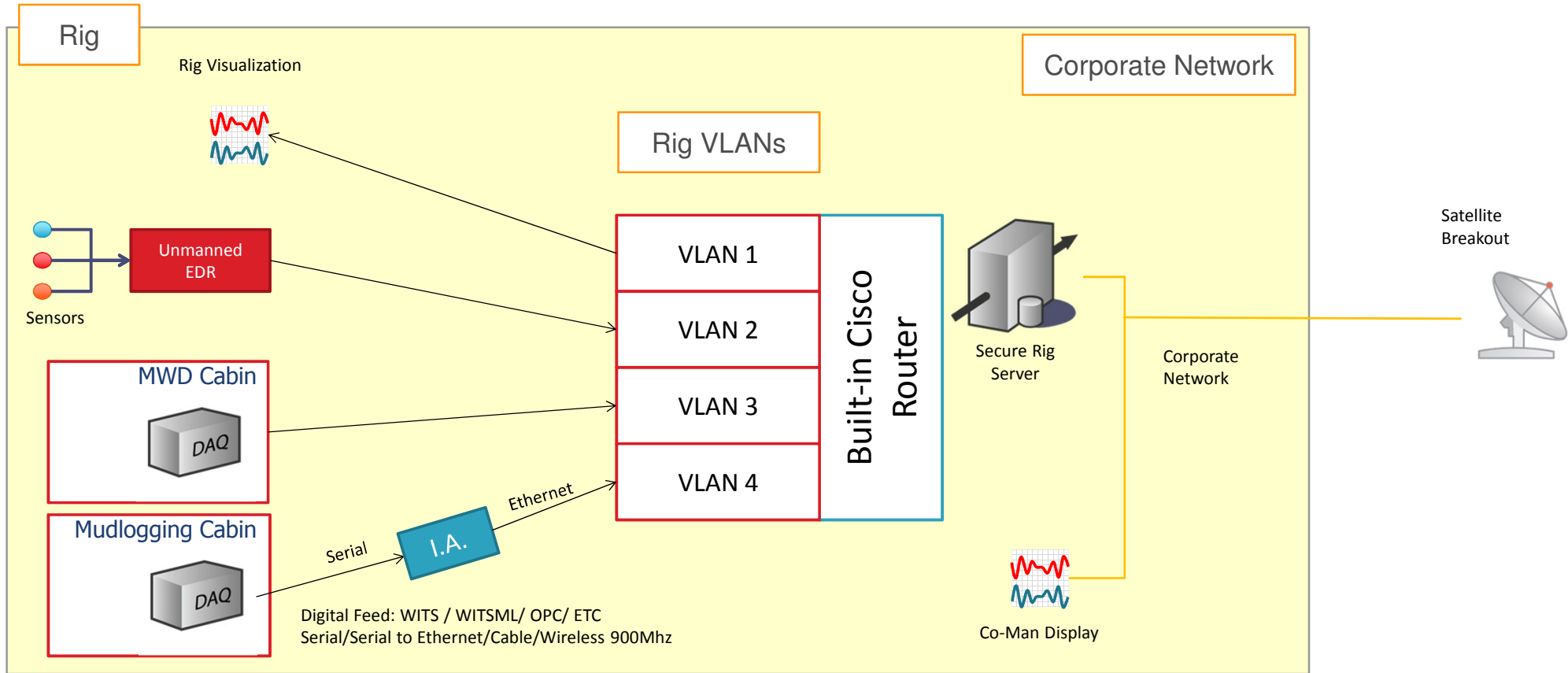


# Slim Secure Rig Server`

- Performance of Secure Rig Server
- Rack-mounted
- Space saving 1U height



# Secure Field Network



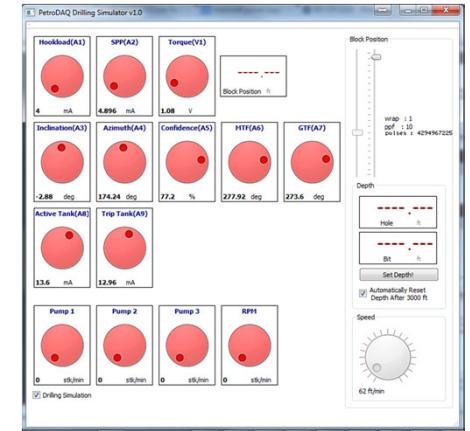
# Lab Drilling Simulator

Output any Sensor signal at 100Khz & 16 bits

Replay past operations

Variable speed control

Simulated Drilling Signals



# Technology and Applications

## Acquisition, Visualization & Modeling

**PetroDAQ**



Universal Data Acquisition

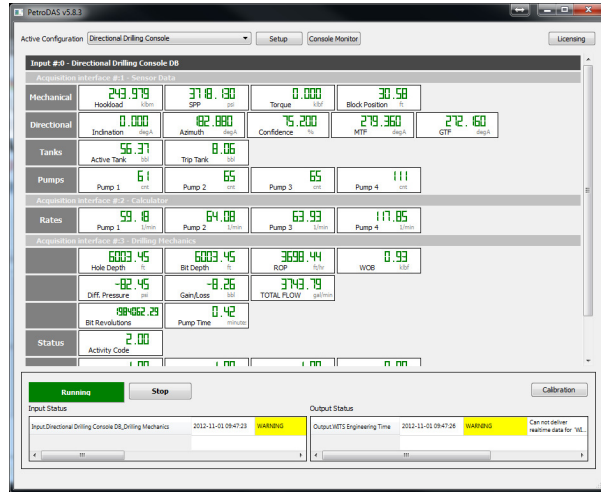
Instrumentation

Data Acquisition

Transmission

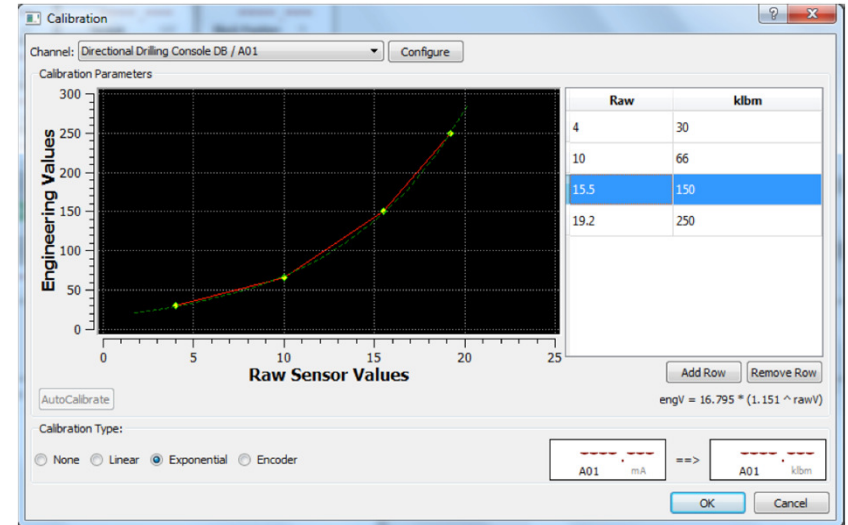
Monitoring

# PetroDAQ Acquisition Software



Channel View

Standard and Proprietary Inputs & Outputs  
Buffered & Real Time Mode



Sensor Calibration

```
def on_delivery(context, datablock): #getting parameters params try: print_on_console("python a\n"); WOB_CH = context.getParam('WOB_CH'); RPM_CH = context.getParam('RPM_CH'); TRQ_CH = context.getParam('TRQ_CH'); ROP_CH = context.getParam('ROP_CH'); D = context.getParam('D'); except EParameterMissing: # Oops - calculation try to use curve that is not available in this datablock print_on_console("Calculation failed parameter is missing:") + (e)+'\n'; return;
```

Scriptable Computational Engine (Python)

# PetroDAS Remote & Diagnostics

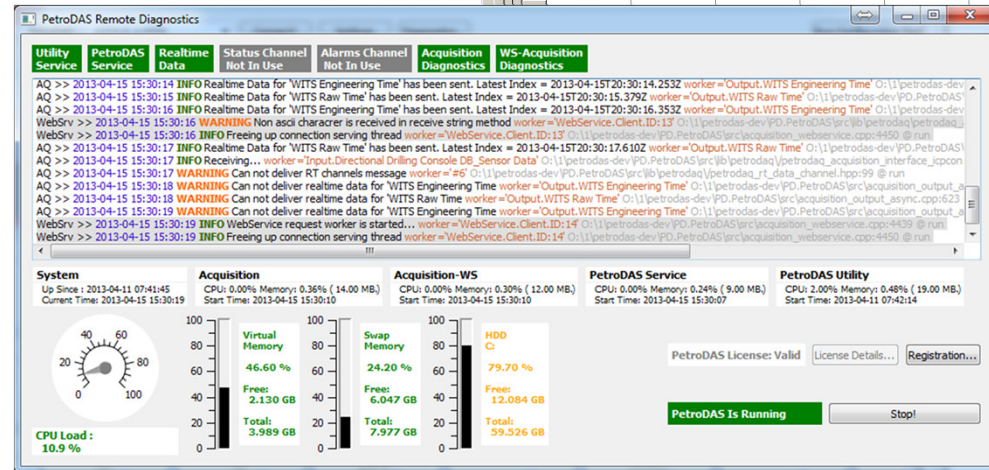
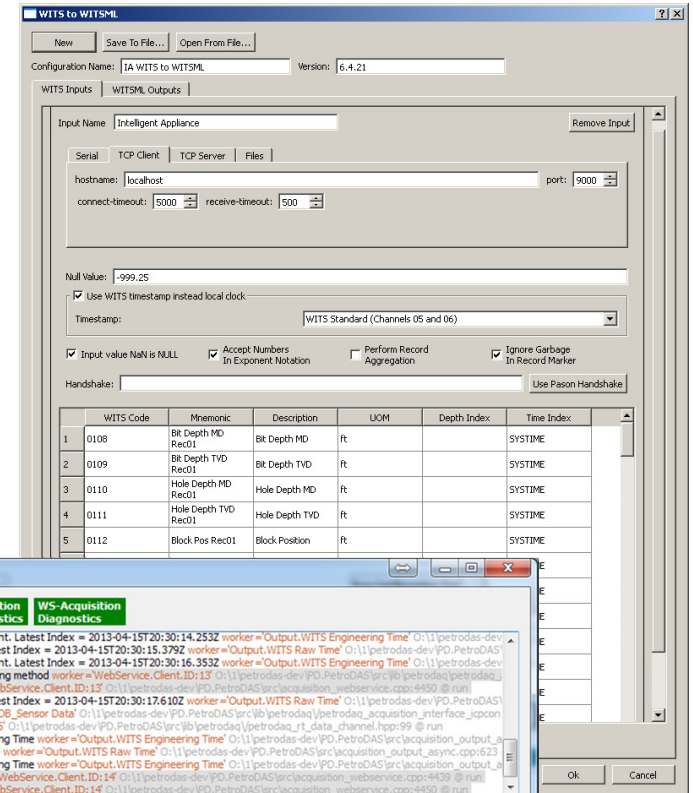
Centralized configuration of multiple operations

Bandwidth efficient

No need for interactive sessions over satellite links

Protocol specific configuration

System Diagnostics

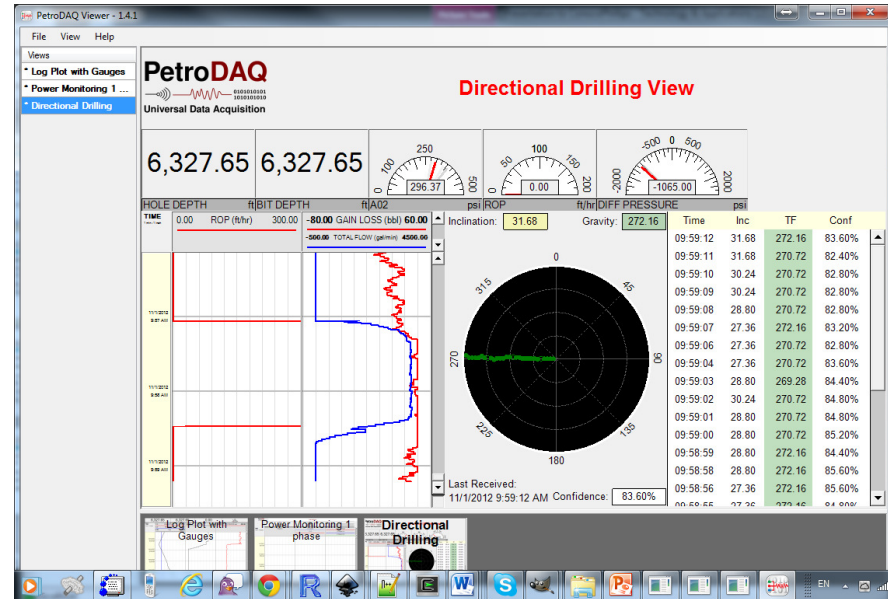


# PetroDAQ Viewer

Customizable Views

Controls for Geology, MWD,  
PVT, and Equipment Monitoring

Supports fast data rates (Khz)





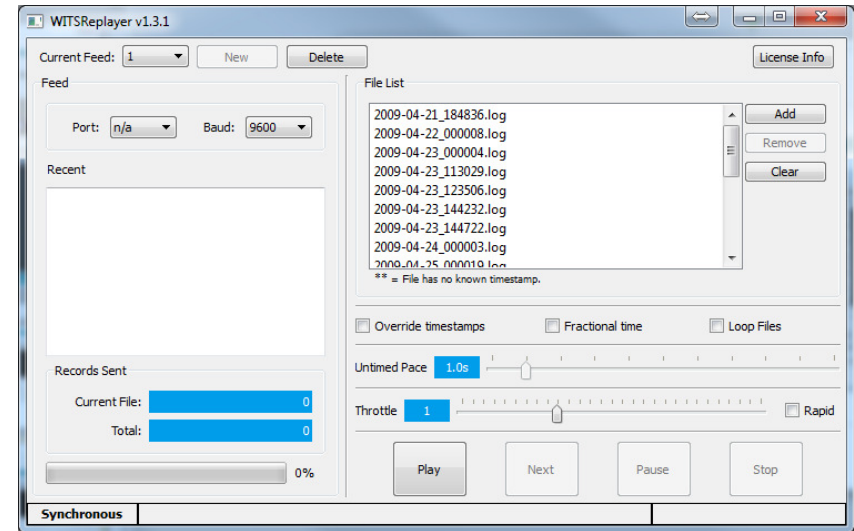
# WITS & WITSML Replayer

Replay recorded operations

Synchronize multiple feeds

Real-time and accelerated data rates

Optional Packet-time restamping



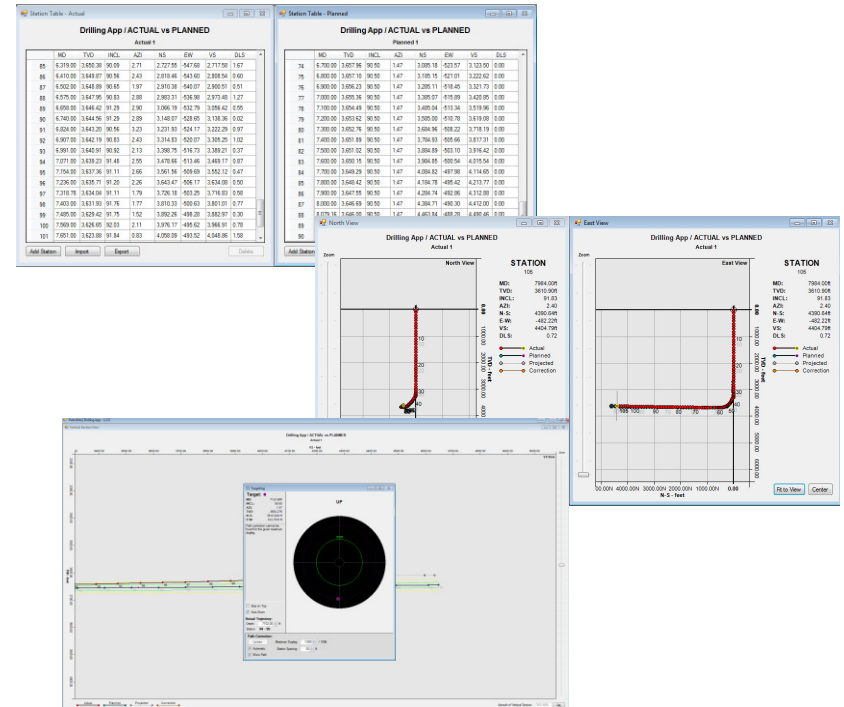
# Directional Guidance for Surface MWD Systems and Office Well Planning applications

Integrates Surface MWD Systems and Office Well Planning applications

WITSML based solution

Well plans are shared with the rig automatically (no imports or fat fingering)

Survey Station corrections are transmitted to the real-time monitoring systems



# WITSML Store

High Performance

Cross Platform

Supports all 1.3.1.1 Objects

Client C# Library

<http://witsml.petrodaq.com>

<http://code.google.com/p/cswitsml/>

**PetroDAQ**  
Universal Data Acquisition

**PetroDAQ WITSML Store**

Welcome to the **PetroDAQ WITSML Store**

PetroDAQ WITSML Store - 1.0.1 - Linux Version supports all objects in 1.3.1.1 version. It is accessible at <http://witsml.petrodaq.com:8080/witsml/wmls.asmx>

PetroDAQ WITSML Store - 2.0.4 - Windows Version supports all objects in 1.2.0 and 1.3.1.1 versions. It is accessible at <https://secure.petrodaq.com/petrodaq/witsml/wmls.asmx>

To request credentials for access to the store, please send us an email at [support@petrodaq.com](mailto:support@petrodaq.com) with your request.

PetroDAQ Data Acquisition Units are **<WITSML/>™ Ready**

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# For more information

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