EZ-BOREHOLE PROFILER

Two-directional Portable EZ-BOREHOLE PROFILER (IQ-BORE) is designed for magnetically clean applications and includes SOLID STATE advanced Pitch / Roll / Temperature compensated miniature compass system. It is built around a state of the art Cortex microcontroller utilizing AOSI's proprietary algorithm on a 0.9" x 2" x 0.5" assembled PCB.
IQ-BORE system includes 1.5" diameter 18.5" long IQ-BORE probe, color handheld display controller and cable. The new directional IQ-BORE probe is able to provide total borehole profile information. The IQ-BORE displays borehole and tool face directions, X-Y-Z magnetic fields, borehole pitch, tool roll and temperature in its integrated handheld controller.

The handheld display controller includes a color display, four touch keys in a soft rubberized case. The system is powered by a single 9 Vdc cell. Advanced Cortex processor monitors all communications with the IQ-BORE probe, sends and receives user commands and displays graphic and numeric data on the screen. All displayed data is in real time. The system also includes special reinforced abrasion resistant cable. Due to the systems modular construction the cable is available in various standard and custom lengths and marked depth increments of "1ft, 5 ft, 10 ft, 1m, 3m, 5m". .

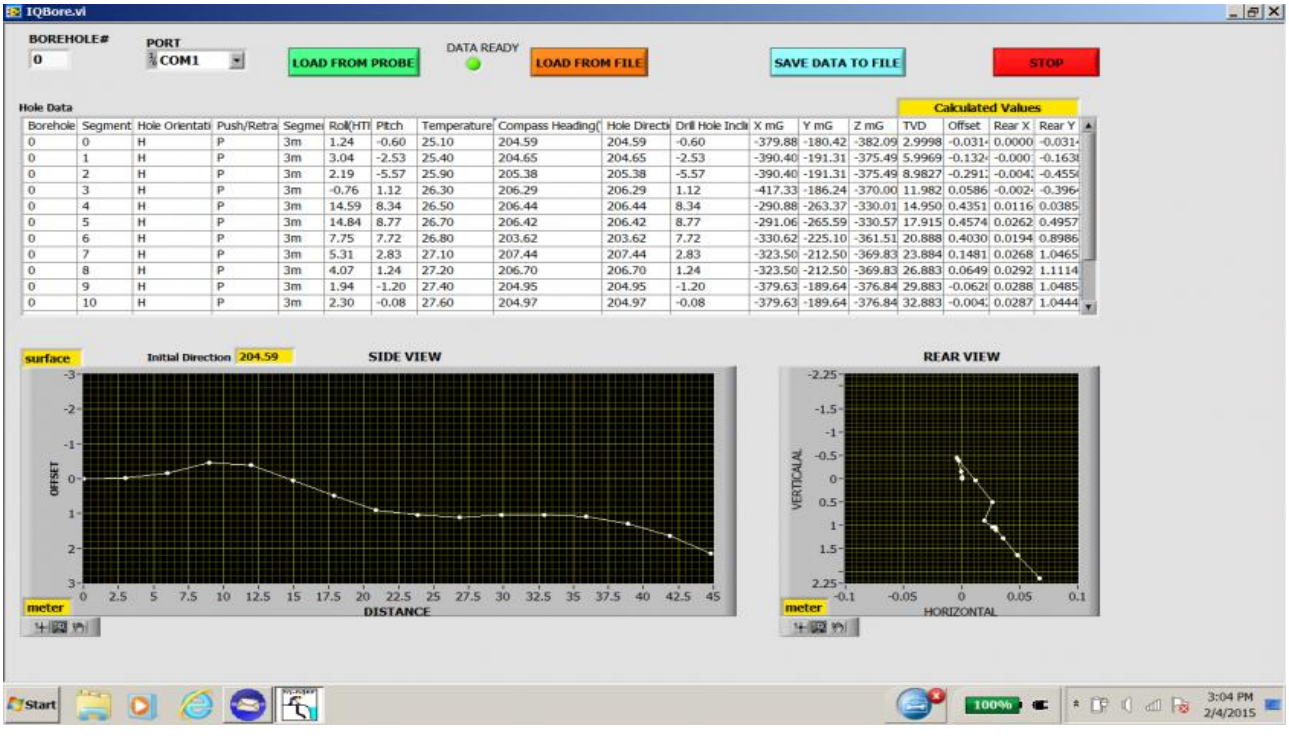
IQ-BORE can profile both VERTICAL as well as HORIZONTAL boreholes; therefore there is no need to have two separate borehole deviation probes (one for each orientation). The user does not need to retract the probe or go through prolonged setups and re-calibration procedures in order to switch between orientation modes.

As IQ-BORE senses the real time direction of the borehole, there is no need to install borehole casing, resulting in IQ-BORE operating in holes with casing and without. Super flexible cable facilitates secure gravitational resting orientation of the probe against the interior wall of the borehole before each reading.

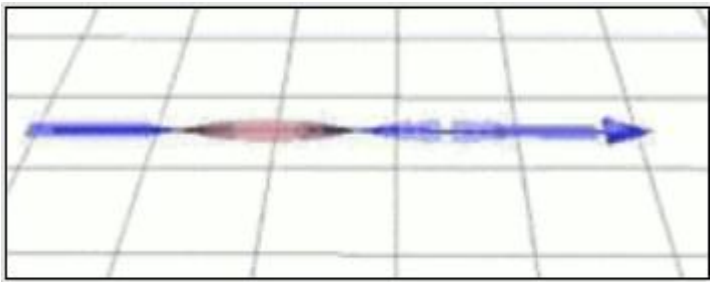
Single click instantly switches from vertical profiling mode to horizontal, or vice-versa. This is achieved by sensing magnetic field of Earth together with pitch and roll orientation of the sensing IQ-BORE head. Then it uses AOSI's algorithm to accurately calculate the 3D orientation of the IQ-BORE and its direction.

Parameter	Specification	Units/description
Azimuth Range	0--360	deg, continuous
Azimuth Resolution	12 (0.08)	bit (deg)
Azimuth Repeatability	< 0.25	deg, typical horizontal
Azimuth Accuracy	< 0.5	deg, typical horizontal, Mag. clean areas
Magnetic Field	+-2	Gauss typical
Magnetic Resolution	< 1	mGauss typical
Pitch Range	+90 to -90	arcdeg after linear correction
Roll Range	+180 to -180	arcdeg after linear correction
Weight	<2kg	Aluminum probe
Deployment modes	2	PUSH-IN, RETRACT
Tilt Resolution	12	bit full scale, both axis
Tilt Repeatability	<2	bits
Temperature	-40 to +85	deg C
Communication	4800--115,200 baud,8,N,1	Micro USB to PC
Supply	9 Vdc cell, USB	9 Vdc cell, USB
Size	1.5" OD, 18.5" long	Probe size
Logging	32 files, manual	capacity 25000 readings

Storage of borehole data is achieved via integrated logging feature. The system can save up to 32 borehole files with total capacity of about 25000 readings. Data is easily transferred to any PC via USB port. Custom software facilitates easy viewing of each borehole data in graphical and numerical modes.



TYPICAL SCREEN VIEW OF A PROFILED HORIZONTAL BOREHOLE



While in Horizontal mode, the IQ-BORE operates in a special (Aileron Roll mode). Just like a rolling jet flying forward rolling around its longitudinal axis, the magnetic probe while at any roll orientation inside the borehole, still outputs accurate borehole direction. Accurate direction is maintained at borehole inclinations of -75 to +75 degrees. This advanced feature sets the IQ-BORE apart from other borehole profiling tools. For inclination angles above |75| degrees, it is recommended to switch to a vertical mode.

This system is perfectly suitable for numerous Trenchless applications like HDD (horizontal directional drilling) and verification of prescribed paths for underground conduits, pipes and cables. The probe can detect and display deviations and/or deflections in horizontal directional drilling drills trajectory attributed to fractured formations or formations changing from soft to hard and back to soft sections.

IQ-BORE can be most useful in any of the following directional drilling applications where other methods are more expensive or not feasible:

- Borehole steering
- Power cable installation
- Crossing waterways and roadways
- Water/sewer/gas/oil line installation
- Telecommunications conduit installation
- Pipeline and environmental inspections
- Congested intersection & shore approaches
- Reduction of fly rock during blasting
- Balancing explosive energy to volume of blasted material

Users can operate the IQ-BORE in both PUSH-IN and RETRACT direction with selectable depth segment settings of 1ft, 5 ft, 10 ft, 1m, 3m and 5m.

Simple file retrieval software lets users transfer files between IQ-BORE to any PC. Profile and rear views of measured boreholes including TRUE VERTICAL DEPTH (TVD) are easily viewed with same software.