On-Line Solution for Real Time Diesel Engine Condition and Performance Monitoring

DK-200 On-Line Diesel Engine Surveillance System

THE DIESEL DOCTOR

ICON RESEARCH

DOCTOR

DK-200

On-Line System from Icon Research

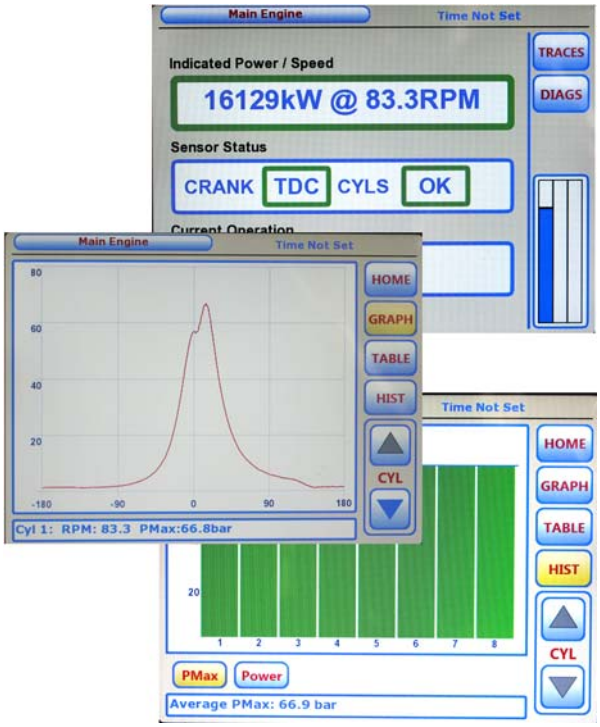
With ...

Doctor Version 6 Software

DK-200 Diesel Engine Surveillance System

FEATURES

- *High Configurable Channel Count*
- *All Channels Sampled Simultaneously*
- *Accurate Indicated Power and Cylinder Pressure Measurements*
- *High Angular Resolution*
- *Measures Static Values such as Turbo RPM and Exhaust Gas Temp*
- *Ethernet Based with Local Colour Touchscreen for Easy Setup*
- *Multiple Units Operate on Same Network*
- *Two Size Formats Available*



On-Line Surveillance

Icon Research is well known for breaking new ground in the diesel engine monitoring world. The DK-200 Surveillance System is the latest innovation in its range of popular monitoring devices.

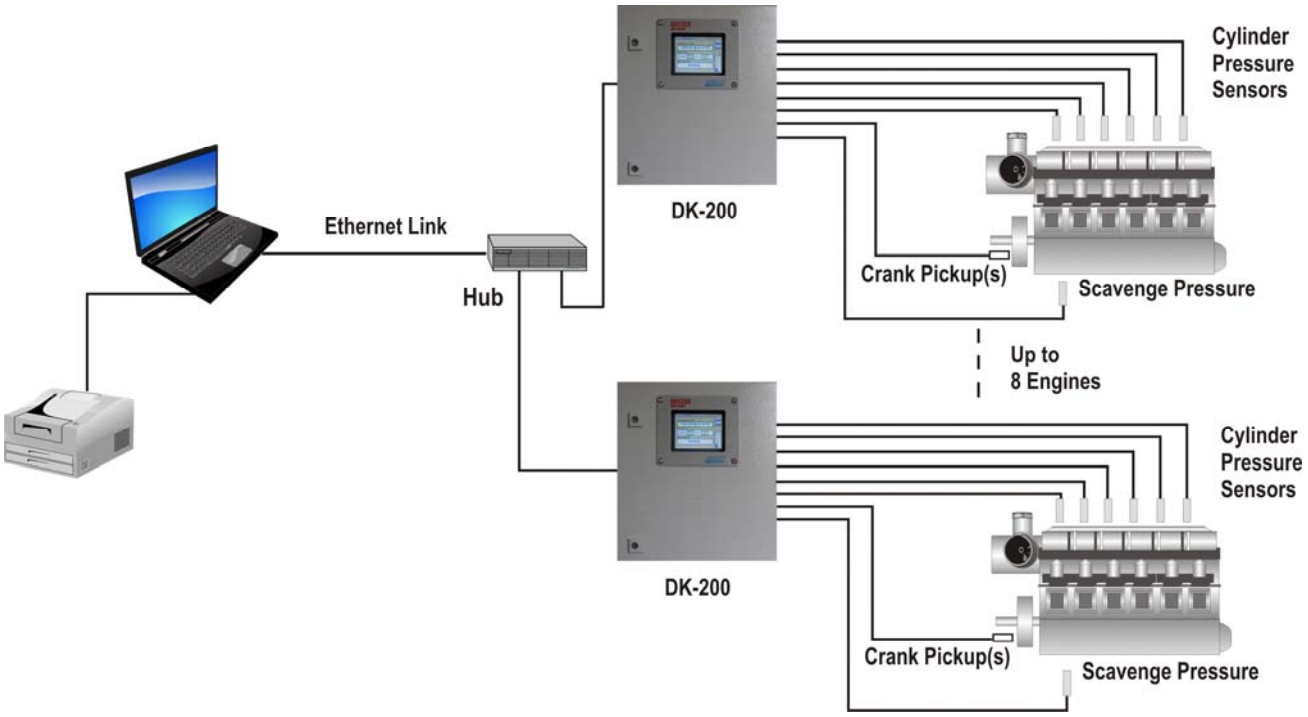
The DK-200 is a powerful combustion monitoring system, but that is just the start. Icon Research has brought together its experience of diesel engine and machinery monitoring to provide a comprehensive flexible surveillance system that measures key parameters on your engines in real time. For those who wish to measure just cylinder pressure, the DK-200 offers up to 24 channels of simultaneous pressure measurement at up to 0.1° resolution. Direct scavenge pressure measurements can also be incorporated. And for a more comprehensive picture of what is happening on your engines, many more measurement possibilities are available, both dynamic and static. For example, you can add scalar measurements from analog signals such as turbocharger RPM and exhaust gas temperature, the measurements being taken at the same time as cylinder pressure measurements for comparative purposes. Or you can add dynamic vibration measurements from standard accelerometers mounted at strategic locations on the engine for overall vibration or comprehensive spectral analysis.

Single (TDC ONLY) or dual (TDC and FLY) crank inputs are available. TDC ONLY is adequate for most medium speed engines whereas dual pickups are recommended for slow-speed engines with direct propeller drive.

Standard sensors for cylinder and scavenge pressure are supported, as well as other types of dynamic and static sensors such as accelerometers and 4-20mA devices. This is achieved using flexible configuration interface modules that match incoming signals to the 24 simultaneous input channels. Thus, any system can be tailored to meet your on-line measurement requirements.

At the core of the DK-200 lies a powerful Linux operating system that drives the high-speed data acquisition engine. Measurements are transferred via high-speed Ethernet to a local PC for real-time display and recording of measurements. Multiple DK-200's can operate on the same network.

The DK-200 comes in two sizes: a 24-channel unit measuring 40cm x 50 cm (16" x 20") and a smaller format 10-channel unit measuring just 30cm x 40 cm (12" x 16"). Installation and setup is straightforward with all hardware contained in a single mains-powered enclosure. A local full colour VGA touchscreen makes setup easy, as well as acting as a local display when the system is running.



On-Line Software

The DK-200 is supported by a comprehensive software application that displays measurements from one or more DK-200's in real time. Displays are configurable depending on the engine(s) being monitored, for example, number of cylinders, measurement types etc.

The software can display an overall summary of the status of all engines using a simple "traffic light" summary. All green means that all measurements are with pre-determined limits. Yellow means that a measurement is slightly outside and should be checked, and red means that a close look should be taken. Clicking on a particular engine displays more detail. Going further down the hierarchy enables graphs and tables of single and multiple engines to be displayed in real time.

	1	2	3	4	5	6	Mean	Var(%)
Engine Speed (RPM)	600.0	600.0	600.0	600.0	600.0	600.0	600.0	0
Scavenge Press (bar)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0
MIP (bar)	24.0	24.0	24.1	24.1	24.1	24.0	24.1	0.382
Indicated Power (kW)	105.8	105.6	105.9	105.9	106.0	105.6	105.8	0.382
Peak Press (bar)	130.2	130.0	130.8	130.3	130.5	130.0	130.3	0.614
Angle of Peak Press (deg)	19.8	19.7	19.8	19.8	19.8	19.8	19.8	0.505
Press at TDC (bar)	100.3	100.1	100.4	100.5	100.4	100.2	100.3	0.353
Max Rate of Press Rise (bar/deg)	3.39	3.39	3.48	3.39	3.42	3.39	3.41	2.69
Angle of Max Press Rise (deg)	10.6	10.7	10.8	10.8	10.8	10.7	10.7	1.86
% MCR (%)	69.4	69.3	69.5	69.5	69.6	69.3	69.4	0.382

The DK-200 on-line software incorporates the popular Doctor V6 module. This provides the full graphic and tabular displays available in V6. Importantly, it includes the Diagnostic option which means that instant diagnostics can be displayed for each measurement set as it comes in from the DK-200 over the network. This enables users to track in real-time what may be happening on their engines.

Setting up the DK-200 to take the desired measurements could not be easier. Engine configurations and measurement settings are defined in the on-line software and a simple 'drag-and-drop' operation sets up the DK-200. Users will find many similarities between the on-line and portable versions of the software, enabling easy familiarisation with the already highly intuitive features.

DK-200/L24 & DK-200/L10 Technical Specification

PRESSSURE MEASUREMENTS

No of Channels:	24 simultaneous (DK-200/L24) 10 simultaneous (DK-200/L10)
Sensor Input Interface:	volts or 4-20mA
Input Voltage Range:	+/-5V or 0-20mA
Signal Voltage Check:	check for out-of-range signals and cable faults
Amplitude Accuracy:	±1% typical

CRANK INPUTS

No of Channels:	2
Modes:	TDC ONLY or DUAL (with Auto-Select)
Crank Sensor Types:	inductive
Crank Sensor Supply Voltage:	24Vdc nominal

RECOMMENDED CYLINDER PRESSURE SENSOR (KPT-1)

Type:	Kistler 6613CG1/2, piezoelectric
Nominal Sensitivity:	50uA/bar nominal (calibration certificate supplied)
Operating Temperature:	350ºC at sensor head
Cable:	high temperature cable supplied with sensor, length 1m

DISPLAY

Type:	640 x 480 full colour VGA
Keypad:	integrated touchscreen (capacitive)
Information:	local diagnostics for setup and commissioning real-time display in normal running mode with selectable displays for graphs, total indicated power, cylinder Pmax and power histograms etc

PERFORMANCE

Engine Speed Range:	20 RPM - 3000 RPM
Resolution:	0.1º up to 1820 RPM 0.2º, 1820 RPM to 3000 RPM
Max Sampling Rate:	102.4kHz
Measurement Update Rate:	dependent on number of averages defined

COMMUNICATIONS

Communications Port:	Ethernet 100Base-T
Connector Type:	RJ45

MECHANICAL

Case:	mild steel, powder coated, anti-vibration mounted
Dimensions:	40cm wide x 50cm high x 21cm deep (DK-200/L24) 30cm wide x 40cm high x 21cm deep (DK-200/L10)
Weight:	14kg approx (DK-200/L24) 11kg approx (DK-200/L10)

ENVIRONMENTAL

Operating Temperature:	-10ºC to +60ºC
Sealing:	IP66
Compliance:	CE, RoHS

POWER

Power Source:	100-240Vac, 50-60Hz

Subject to change without notice

Issue B

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