

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

**DK-200 On-Line  
Diesel Engine  
Surveillance  
System**



**ICON  
RESEARCH**

**DOCTOR**

**DK-200**

On-Line System  
from  
Icon Research



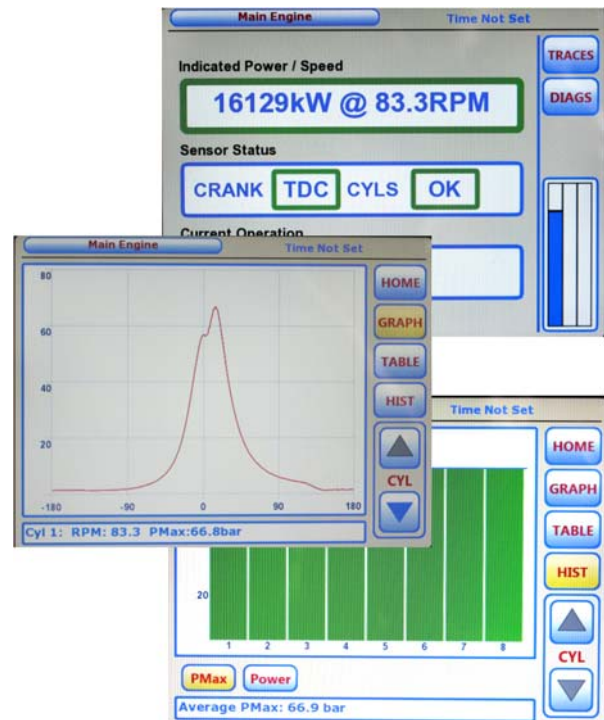
With ...

**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 0.1 Degree Angular Resolution
- Ethernet Connection with Local Colour Touchscreen for Easy Setup
- Interfaces with Doctor V6 Software with In-Built Diagnostics
- Multiple Units Operate on Same Network
- Three Model Types for 8, 16 and 24 cylinders



### On-Line Surveillance

Icon Research is well known for breaking new ground in the diesel engine monitoring world. The DK-200 Surveillance System has now been revamped and is offered in three model types offering a range of cylinder counts, namely 8, 16 or 24 cylinders. Two-stroke, 4-stroke, in-line and V-engines are all catered for.

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 diagnostics to provide a comprehensive flexible surveillance system that measures the key parameters on your engines in real time. All cylinders are measured simultaneously at up to 0.1° resolution. Direct scavenge pressure measurements can also be incorporated.

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. The internal eight-channel signal interface boards are configured to select between voltage and 4-20mA signal types. One, two or three of these interface boards are fitted to accommodate

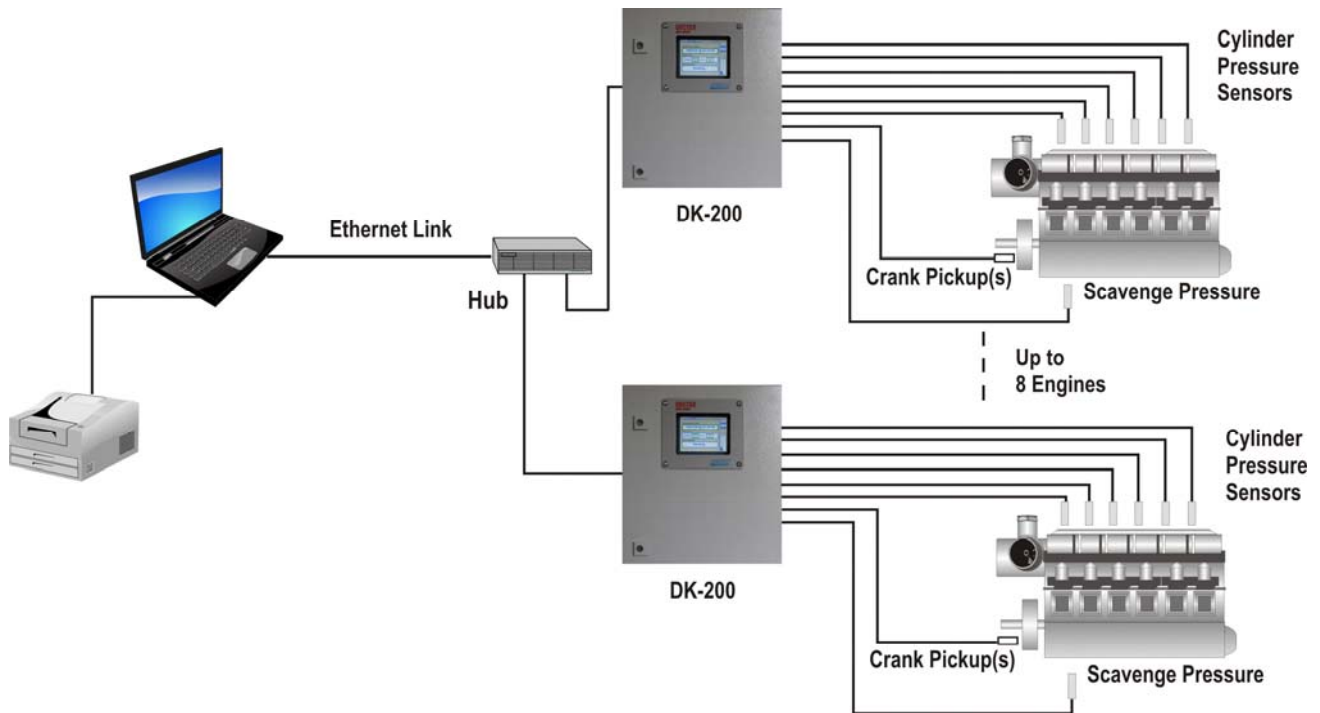
8, 16 or 24 cylinders. Thus, any system can be tailored to meet your exact on-line requirements. And sensor diagnostics identify any faulty sensors.

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 connected back to a single PC for comparative engine measurements.

The PC-based viewing software incorporates a dashboard showing a global summary of all engines on your vessel or site. A green/amber/red traffic light display system indicates the status of the engines. Sub-levels enable individual cylinder parameters and traces to be examined. Diagnostic engine reports can be generated as required.

The DK-200 comes in a robust sealed enclosure measuring just 30cm x 40 cm (12" x 16" approx). 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. Just specify the number of cylinders on your engine at time of ordering and the DK-200 can be configured to suit.

# System Overview



## 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 within 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.

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.

Doctor Online Viewer V1.3: Hilary

Print Unlocked Overall Table Bargraph Trends Analyse

Aux 1: 634.8kW, 600.0RPM (09:48:12)

	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

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 for one or more DK-200 units that are connected. Users will find many similarities between the on-line and portable versions of the software, enabling easy familiarisation with the already highly intuitive features.

## Technical Specification

# DK-200/L8, -/L16 and -/L24 Technical Specification

### PRESSURE MEASUREMENTS

No of Channels:	8 simultaneous (DK-200/L8) 16 simultaneous (DK-200/L16) 24 simultaneous (DK-200/L24)
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 SENSORS

Type:	Kistler 6613CG2 (KPL-2) for 2-stroke engines and 6635A1 (KPL-3) for 4-strokes
Range:	0-250 bar (6613CG2) and 0-350 bar (6635A1), calibration certificate supplied
Operating Temperature:	350°C at sensor head
Cable:	extension cable standard length 20m (other lengths available to order)

### 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:	0.1° up to 1820 RPM 0.2°, 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:	30cm wide x 40cm high x 21cm deep
Weight:	11kg approx

### ENVIRONMENTAL

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

### POWER

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

*Subject to change without notice*

Issue F

**Icon Research Ltd**  
**3 Raw Holdings**  
**East Calder**  
**West Lothian**  
**EH53 0HY**  
**UK**  
**Tel: +44 (0)1506 885000**  
**Fax: +44 (0)1506 885501**  
**Web: [www.iconresearch.co.uk](http://www.iconresearch.co.uk)**

**Authorised Agent**

**Icon Research Ltd**