

Knock Indication System (KIS)

Generation 4

Knock Indication System 4 is a measuring instrument for computing, displaying and evaluating measured knock-specific and thermodynamic values from internal combustion engines.

KIS4 consists of high-performance hardware capable of operating on engines with up to eight cylinders where it can process cylinder pressure, knock-sensor and other analog signals. The system also includes application software that is used for controlling measurements, for configuration purposes and for displaying and evaluating signals.

The system for engine calibration is designed for test bench automation. It is easy to use and can be deployed in the vehicle.

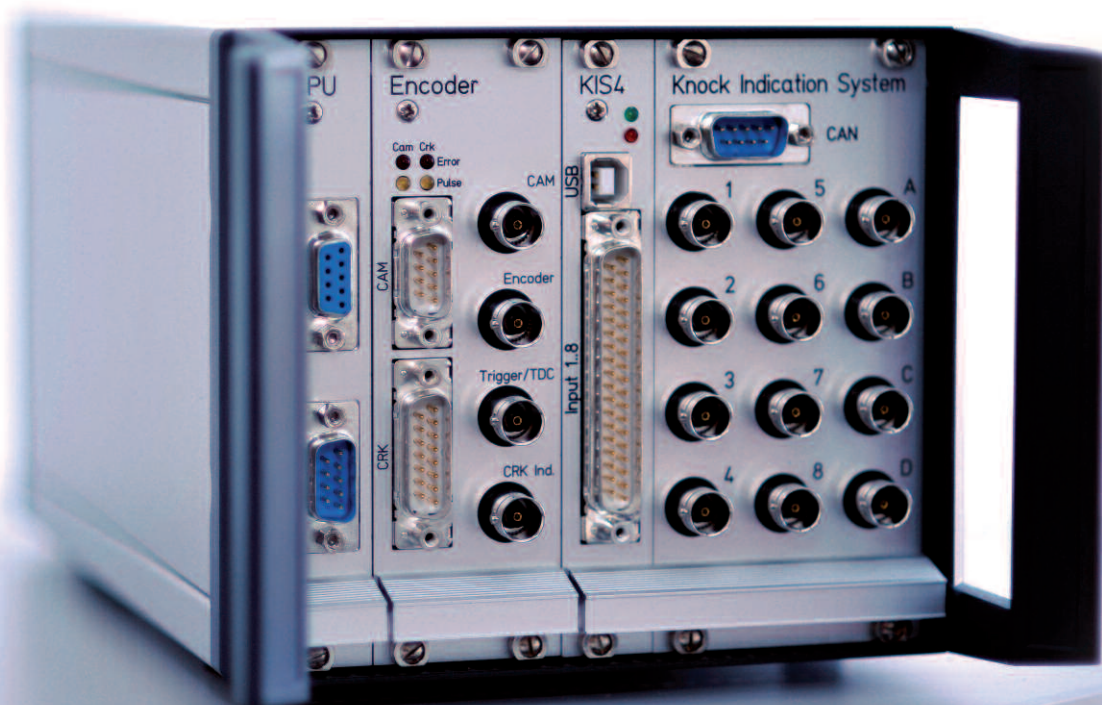
Low cost solution for:

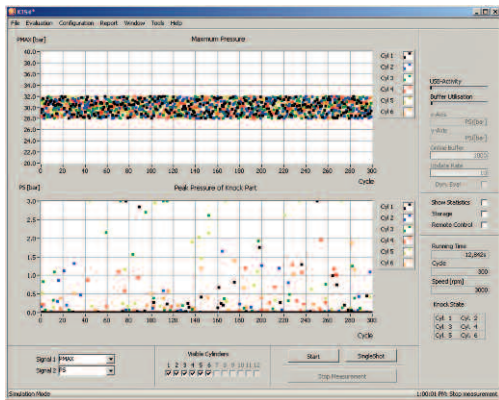
- Knock detection
- Calibration of knock control
- Combustion analysis

KIS4 is ideal for calibration purposes and is less costly compared to standard indication systems.

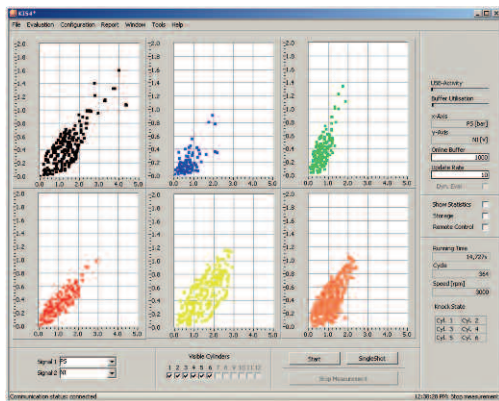
Features

- Calculation of knock-specific, thermodynamical and statistical values
- Powerful data acquisition of cylinder pressure signals, knock sensor signals, other analog signals and encoder signals
- Visualization of measurement parameters in graphical and numerical form
- Recording of input signal traces for post processing
- Misfire detection
- Relay function for feed-through signals

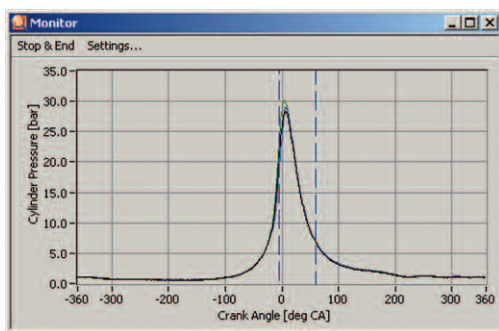




Online statistics



Correlation mode



Pressure curve monitor

Stop & End	Select Value	View	Cyl. 1	Cyl. 2	Cyl. 3	Cyl. 4	
	PMAX		29.92	30.02	29.77	30.07	bar
	PMAX_POS		11.07	8.60	9.05	10.48	deg CA ATDC
	N		2999.82	3000.11	3000.06	3000.00	rpm
	PS		0.00	0.05	0.00	0.04	bar
	p85		0.52	1.03	3.27	3.05	mbar
	CA10		-2.02	-1.83	-2.48	-1.62	deg CA ATDC
	CA50		25.02	25.22	25.07	24.73	deg CA ATDC
	CA90		50.00	49.64	49.91	49.99	deg CA ATDC
	COV		3.18	2.74	3.23	2.45	%
	IMEP		4.51	4.78	4.39	4.49	bar
	PMEP		0.50	0.75	0.26	0.64	bar
	NMEP		9.05	10.18	9.50	11.06	bar

Numerical display

Measured and Calculated Values

- Knock peak value
- Noise integral
- Knock value p85
- Knock rate
- Maximum pressure signal
- Position of maximum pressure signal
- Maximum pressure change
- Position of maximum pressure change
- Different mean effective pressures
- Position of 10 %, 50 % and 90 % heat release
- Engine speed
- Misfire detection
- Coefficient of Variation (COV)

Offline Evaluation

- Correlations
- Histograms
- Probability density and cumulative distribution functions
- Gaussian or lognormal fitting
- Special evaluation tool for dynamic measurements
- Statistics for knock detection and knock control

Technical Features

- 8 freely configurable input channels
- Sample rate: 400 kHz
- Resolution: 16 bit
- Input channel range: -10 V to +10 V
- Powerful FPGA filtering
- Digital signal processor
- Engine speed up to 8000 rpm
- CAN interface (integration of third-party hardware, e. g. test bench system)
- USB 2.0 interface