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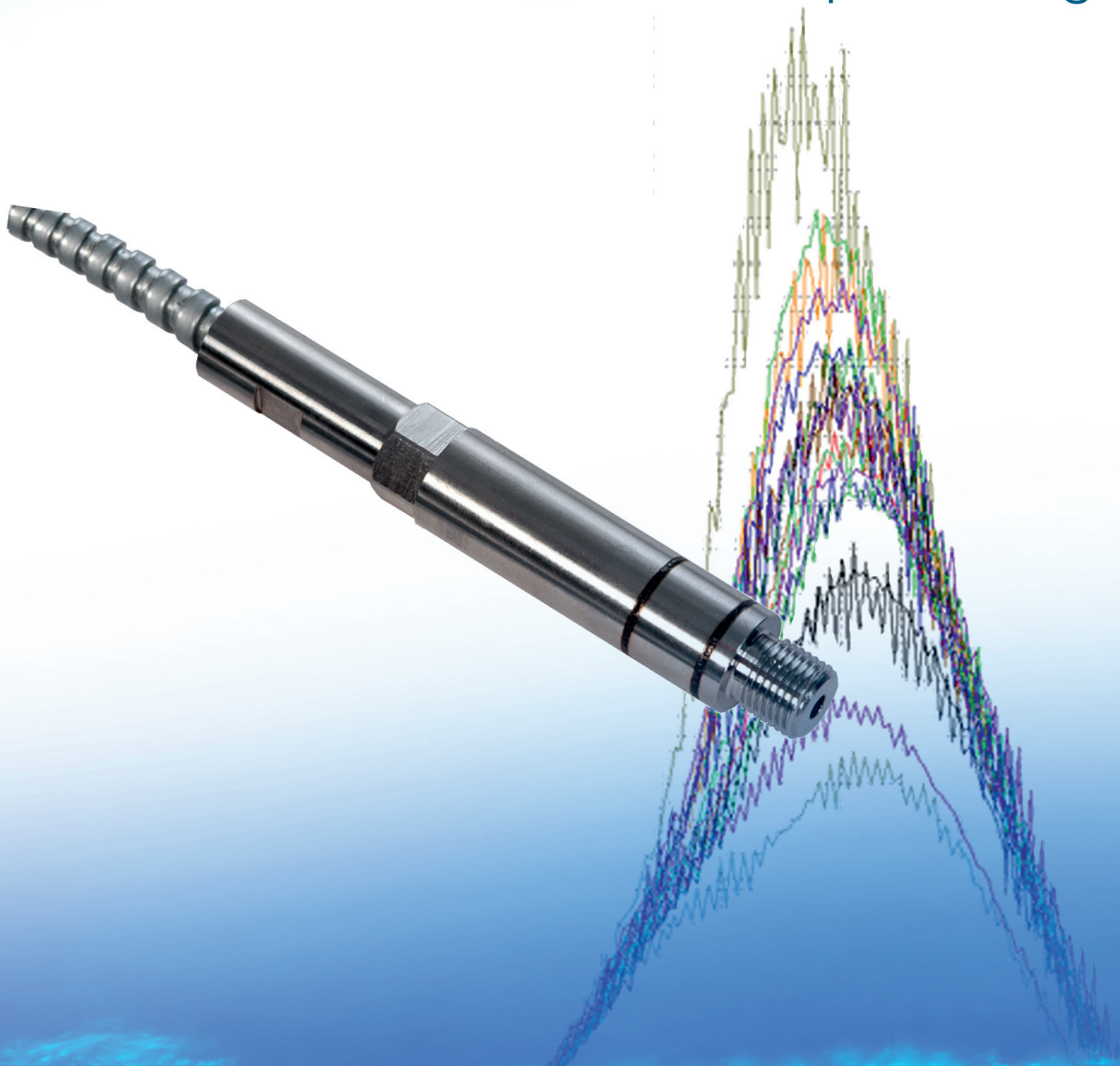
the cylinder pressure people

CCM GAS

for optimal engine control



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CCM Gas Engine control

CCM Gas Engine control is a modern combustion pressure processing system for spark ignited- and dual fuel gas engines. Pressure data for every combustion cycle on every cylinder are evaluated and specific combustion parameters for example: peak pressure, knock and misfire are calculated for advanced pressure control of marine- and stationary gas engines, combined with monitoring.

Combustion Control Module CCM

CCM is a smart combustion signal processing device for marine- and stationary gas engines. It is mounted in a robust housing.
The CCM function is to acquire and process real time data from cylinder pressure sensors on spark ignited or dual fuel gas engines. It is designed for cylinder balancing and to detect knock and misfire.

High precision cylinder pressure measurements

IMES combustion pressure sensors type HTT-04CA and CPS-01CA for continuous measurement of cylinder pressure on gas- and dual fuel engines offer a very good thermodynamic performance.
They are characterised by their long term accuracy with minimal signal drift over long periods combined with their outstanding cost-effectiveness.
Designed for a minimum of 16,000 operating hours, they enable the acquisition of highly accurate, processable data.

Marine Type Approvals

IMES sensor types have received Marine Type Approval from all significant international societies such as Bureau Veritas, DNV, ABS, Lloyd's Register, China Classification Society and NK class. Also for the combustion control module CCM Marine Type approval is in preparation.

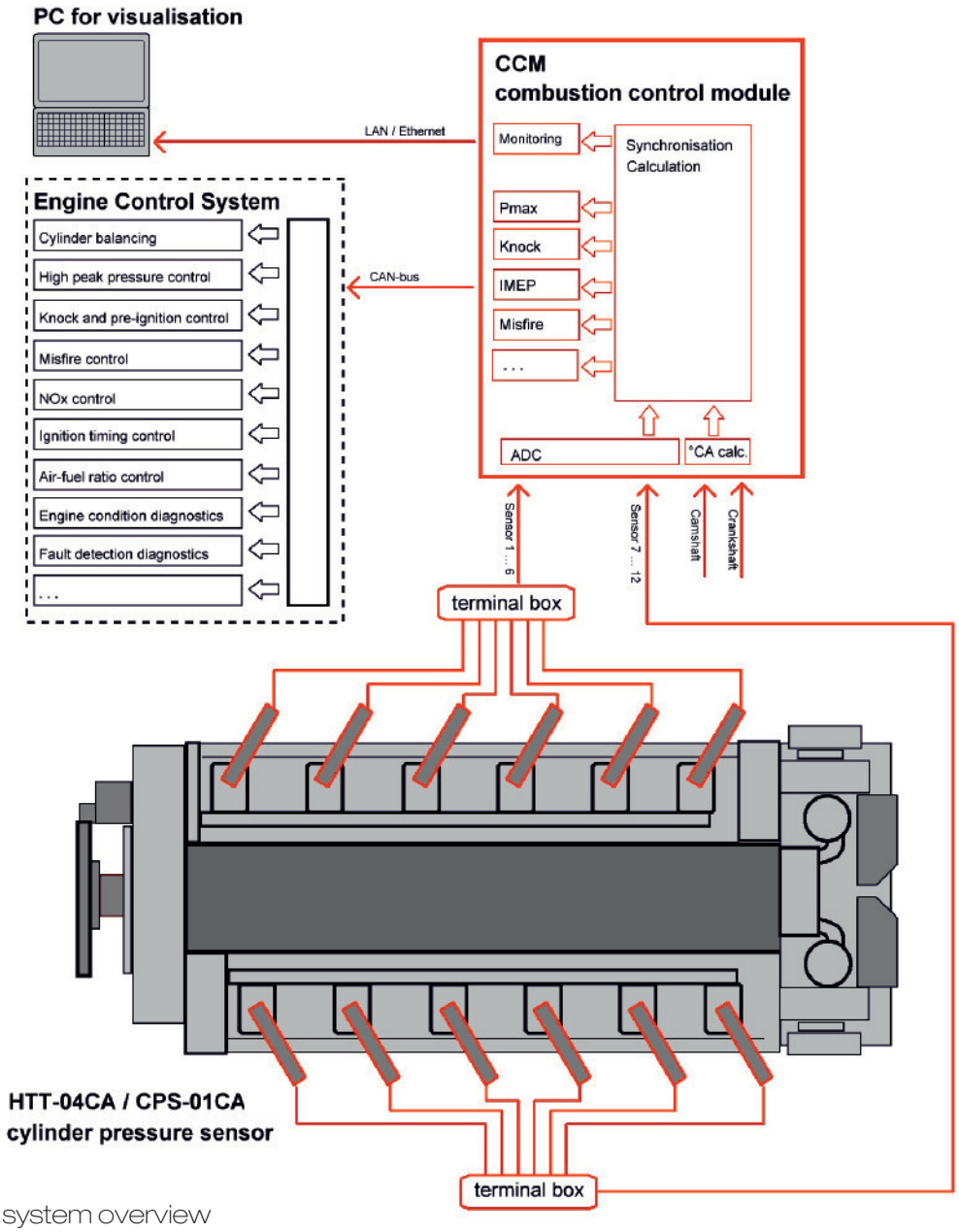
for modern combustion control solutions

CCM Gas Engine control includes permanent installed cylinder pressure sensors and high speed data acquisition unit CCM.
It is easy to install and the calculated data can be transmitted directly to the control system to stabilise engine operation.

Main benefit:

- cylinder balancing
- knock detection
- misfire detection
- thermodynamic parameters

- minimising gas consumption
- minimising NOx emission
- comply with IMO TIER III emission limits in Emission Control Areas (ECAs)



system overview

Combustion values calculated in CCM and transmitted

Knock detection

The knock control concept identifies combustion knock in cylinders to protect the engine against damage.

Peak pressure

The control system monitors engine operation and initiates a quick reduction in output or an engine cut-off if necessary, because malfunctions of the engine controller can cause cylinder or engine failure.

IMEP

IMEP calculations enable to optimise the combustion process by cylinder output balancing. This can recuce fuel consumption up to 2%.

Robust housing

The CCM box is very robust and it is proven for many years as it is still in use for several other engine control systems (e.g. electronically controlled injection systems).

to control system for perfect engine operation

Misfire detection

Every combustion process with weak- or misfire will be detected to realise early defect spark plugs or injectors.

Thermodynamic parameters

CCM processes and calculates heat release rate in real time in each cylinder which is an important information for the control system for optimising engine efficiency.

Plug- and play concept

CCM can be installed directly at the engine or inside a cabinet.
A sophisticated plug- and play concept enables an easy fitting of cylinder pressure sensors and pulse inputs at CCM-housing.

System integration

CMM communicates via CAN bus with the engine control system and it can be integrated to the engine management system.

CCM Gas Engine portable for cylinder balancing and

CCM Gas Engine portable monitors and analysis cylinder pressure data from up to 20 cylinders in the field by calculating knock intensity and misfire of each cylinder. The system allows an easy and accurate adjustment of the existing vibration knock detection system.

CCM Gas portable box

CCM Gas portable box includes the inside mounted CCM hardware module, all cables and connectors. The comprehensive, transportable plug- and play system can be rapidly installed on-site to enable acquisition of cylinder pressure data on spark ignited- and dual fuel engines.

Cylinder pressure sensors HTT-04 and CPS-01

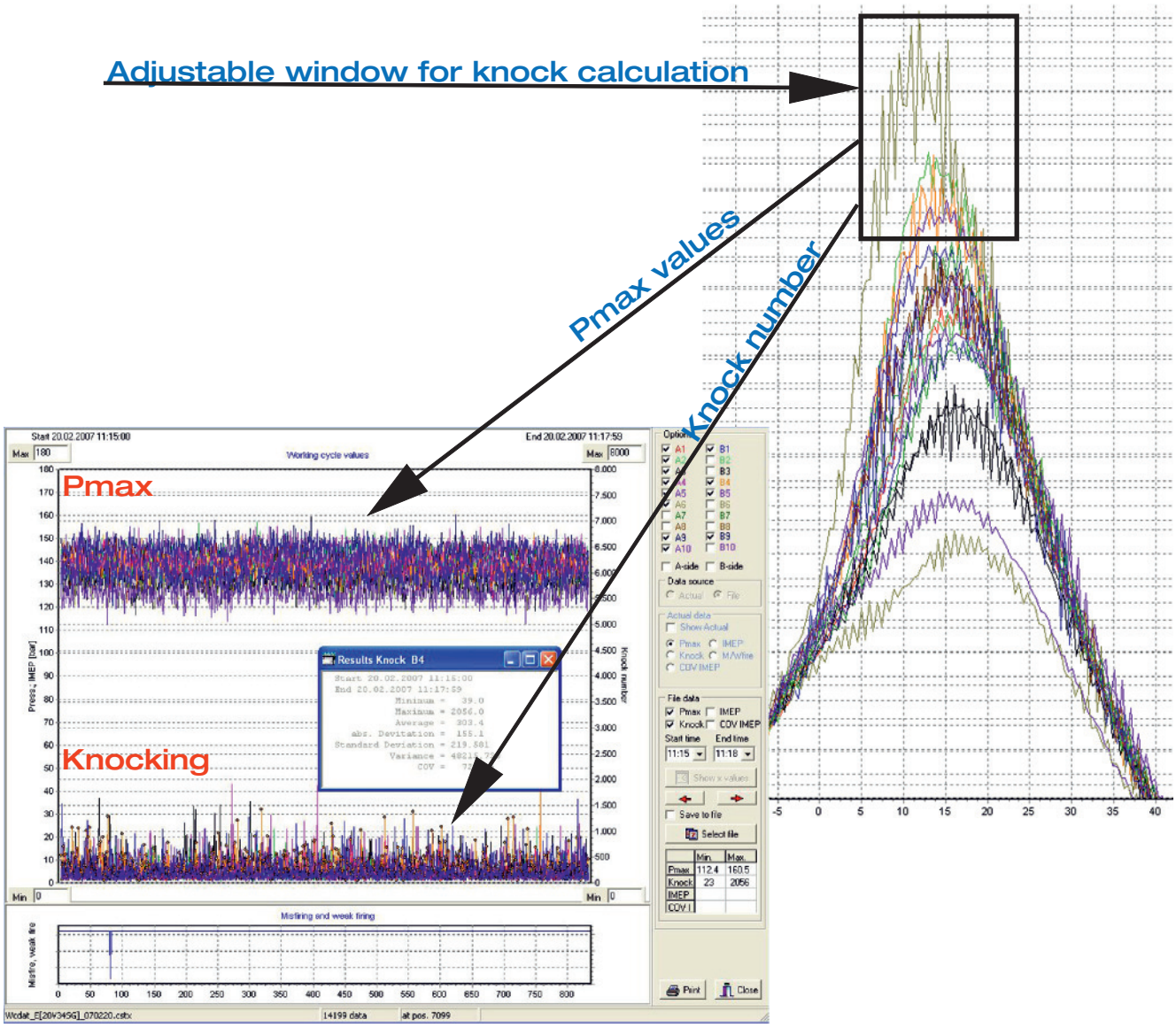
IMES combustion pressure sensors HTT-04 and CPS-01 for measurement of cylinder pressure on gas- and dual fuel engines are characterised by their long term accuracy with minimal signal drift over long periods combined with their outstanding cost-effectiveness.
Designed for a minimum of 16,000 operating hours, they enable the acquisition of highly accurate, processable data.

Protection Cover for signal conditioning unit (SCU)

The protection cover is available for SCU of cylinder pressure sensors type: TCS-01CA, HTT-04, HTT-04CA, CPS-01 and CPS-01CA. It is easy to mount on SCU, reduces vibration and is temperature and oil resistant.

optimal adjustment of traditional knock detection system

Using CCM Gas Engine portable for cylinder balancing and the adjustment of the knock detection system is much easier and more accurate than using the traditional method due to using accelaration sensors. The engine specific knock parameters are permanently stored in the manufacturer's engine settings. The CCM software monitors and analysis knock intensity and misfire of each cylinder.



The CCM visualisation software for use on 4-stroke gas engines for up to 20 cylinders offers the possibility of selecting advanced monitoring functions in the following diagrams: pressure/CA, Pmax balance, IMEP balance and trending diagram

The stored data enable to adjust engine optimally. The cylinder conditions can be optimised and the engine can be easily balanced and tuned in order to improve the running performance.

the cylinder pressure people

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