

# Advanced visualisation software

The CCM PC software is a modernised version for online combustion monitoring. The recorded data can be used to diagnose malfunctions or to assist in the setting and optimising of engine operation parameters.

The software offers the possibility of selecting advanced monitoring functions in the following diagrams and reports:

- **Pressure/CA curve diagram**
- **Pmax and Pcomp diagram**
- **Pmax balance**
- **Pressure volume diagram**
- **working cycle diagram**
- **IMEP balance and event recording**
- **Engine report**

The measured data can be transmitted to the **IMES Performance Evaluation Software (IPE)**.

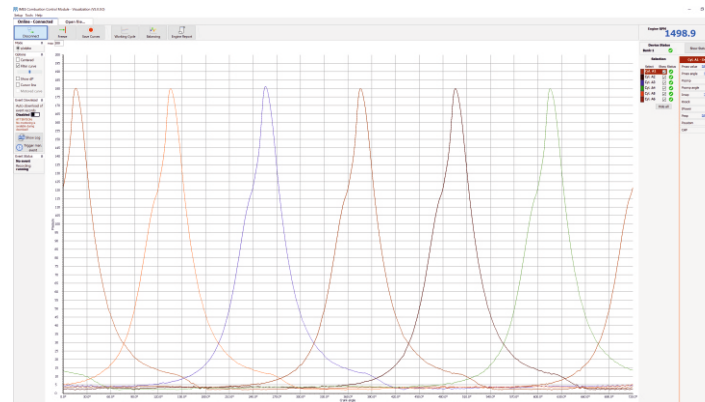
In addition to the IMES data acquisition software it offers advanced functions to facilitate the collection, evaluation, management, and comparison of engine performance data. The software evaluates the current engine performance automatically by comparing the actual ISO corrected measurement with the reference (shop test) data at any load point. Due to this the user receives a quick and reliable overview on many operational aspects.

## Main features:

- ISO correction
- automatic evaluation of current engine performance data
- performance graphs and reports show deviation and suggest actions to take
- automatic data transfer from CCM to IPE

# Event record

CCM offers an event storing, this means, that a large memory buffer records combustion data and pressure curves from the latest 40 combustion cycles on 4-stroke engines or rather the latest 80 cycles on 2-stroke engines. In case of deviation from engine performance parameters set by the engine operator or engine builder CCM automatically records the failure cycle plus the latest 39 (or rather 79) cycles before. This means all combustion data are stored in CCM hardware and the CCM visualisation software is able to compare and analyse the cause of the event afterwards.



Besides the user has the possibility to save the latest 40 (80) cycles manually under different load or different environmental conditions, e.g. during shop test, sea trial or voyage. He can use the recorded data for later comparison or analysis of engine performance und various conditions. The CCM event record enables to analyse the data before, during and after failure. So, it is possible to determine the cause of failure and to find solutions how to prevent in the future.

**You are welcome to contact us at any time for further information and support.**

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# CCM Combustion Control Module

for gas-, marine diesel and  
future fuels engines



[www.imes.de](http://www.imes.de)

# CCM

## Combustion Control Module

CCM is an easy to use plug and play system, which enables real time data acquisition of cylinder pressure on gas –, marine diesel and future fuels engines. Data can be recorded from up to 24 cylinders for closed loop control applications and to diagnose malfunctions or to assist in the setting and optimising of engine parameters e.g. balancing cylinders.

Every combustion cycle will be evaluated on every cylinder for to calculate key parameters engine builder need to implement cylinder pressure based control on engines. Its quick data acquisition and recent evaluation software enables extensive analysis about engine performance.

### Main functions:

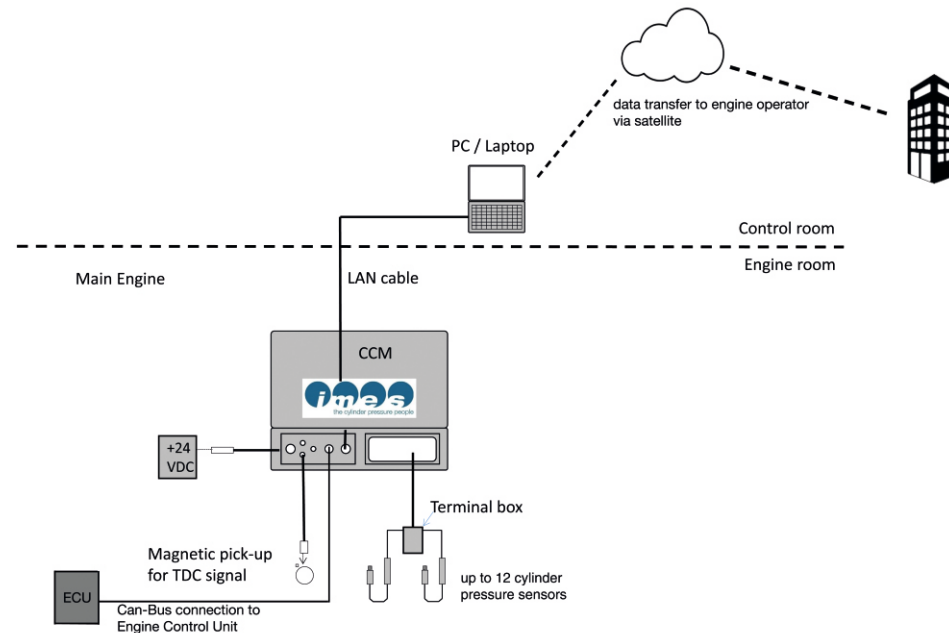
- Knock detection
- Misfire detection
- Calculation of thermodynamic parameters
- Peak pressure
- IMEP, IPOWER

CCM communicates via CAN bus with the engine control system and it can be integrated to the engine management system. A further important function is that all data can be transmitted via internet to the server of the engine operator. This enables to control the engine from land.

### Benefit

- Optimum cylinder balancing
- Optimization of fuel consumption
- Decrease of wear and tear
- Reduction of greenhouse gas carbon dioxide

## Fixed and continuous operation



The CCM system can be directly installed at the engine. A sophisticated plug- and play concept enables an easy fitting of cylinder pressure sensors and pulse inputs to the CCM housing.

Our various types of cylinder pressure sensors are suitable for installation on 2 – and 4-stroke engines and mesh with our CCM system. Depending on engine type we offer sensors with various thread (M5 x 0,5, M8 x 0,75, M10 x 1, M14 x 1,25), various sleeve and cable length and different measuring cells.

### Tecnical data

CCM Combustion Control Module		Cylinder pressure sensors	
Multichannel data acquisition unit	Max. 12 analog inputs	Measuring range pressure	0...300 bar
	Resolution 0.1° CA @ 1800 rpm	Over pressure	1200 bar, 1600 bar
	Interface: CAN-bus Ethernet	Thermal shock 1500 RPM pmi=9bar	<+/- 0.5 bar
	Power supply: 24 VDC	Accuracy error	≤ 1% Full scale