PMI Auto-tuning on ECS MOP

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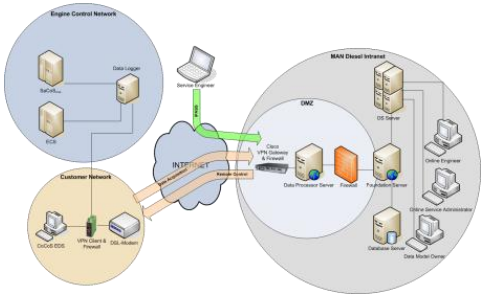
Marine Low Speed – Engine Control & Monitoring
LDC2-Engine Operation Management

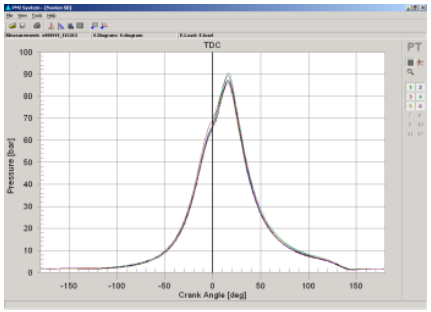
Disclaimer

All data provided on the following slides is for information purposes only, explicitly non-binding and subject to changes without further notice.

Engine Operation Management



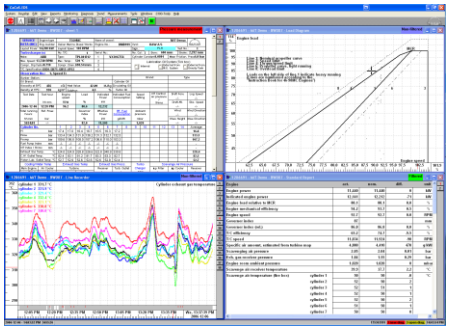
➢Online Service



➢PMI

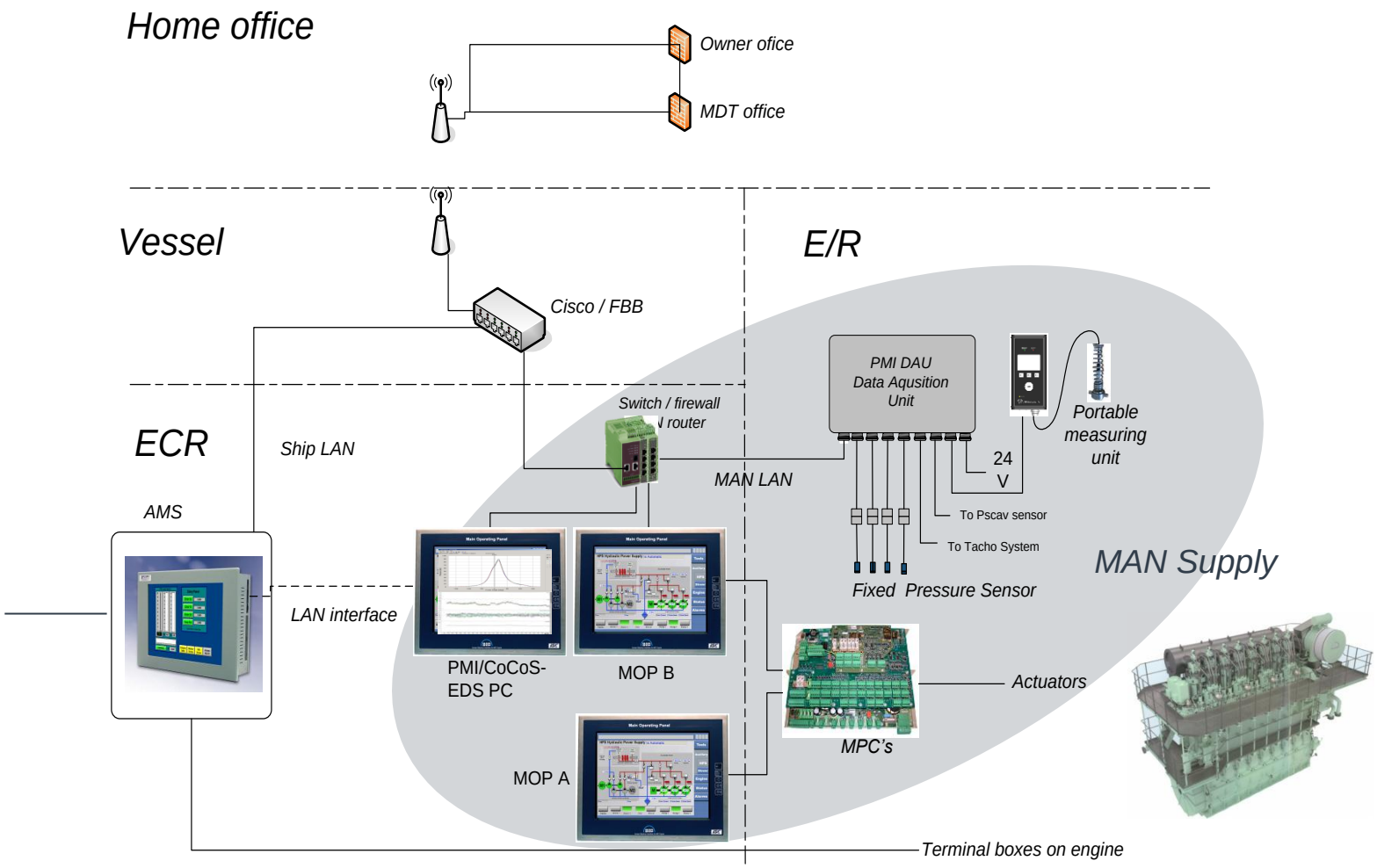
Tools for:

Condition Monitoring
Troubleshooting & Diagnostics
Performance Evaluation
Performance Optimization

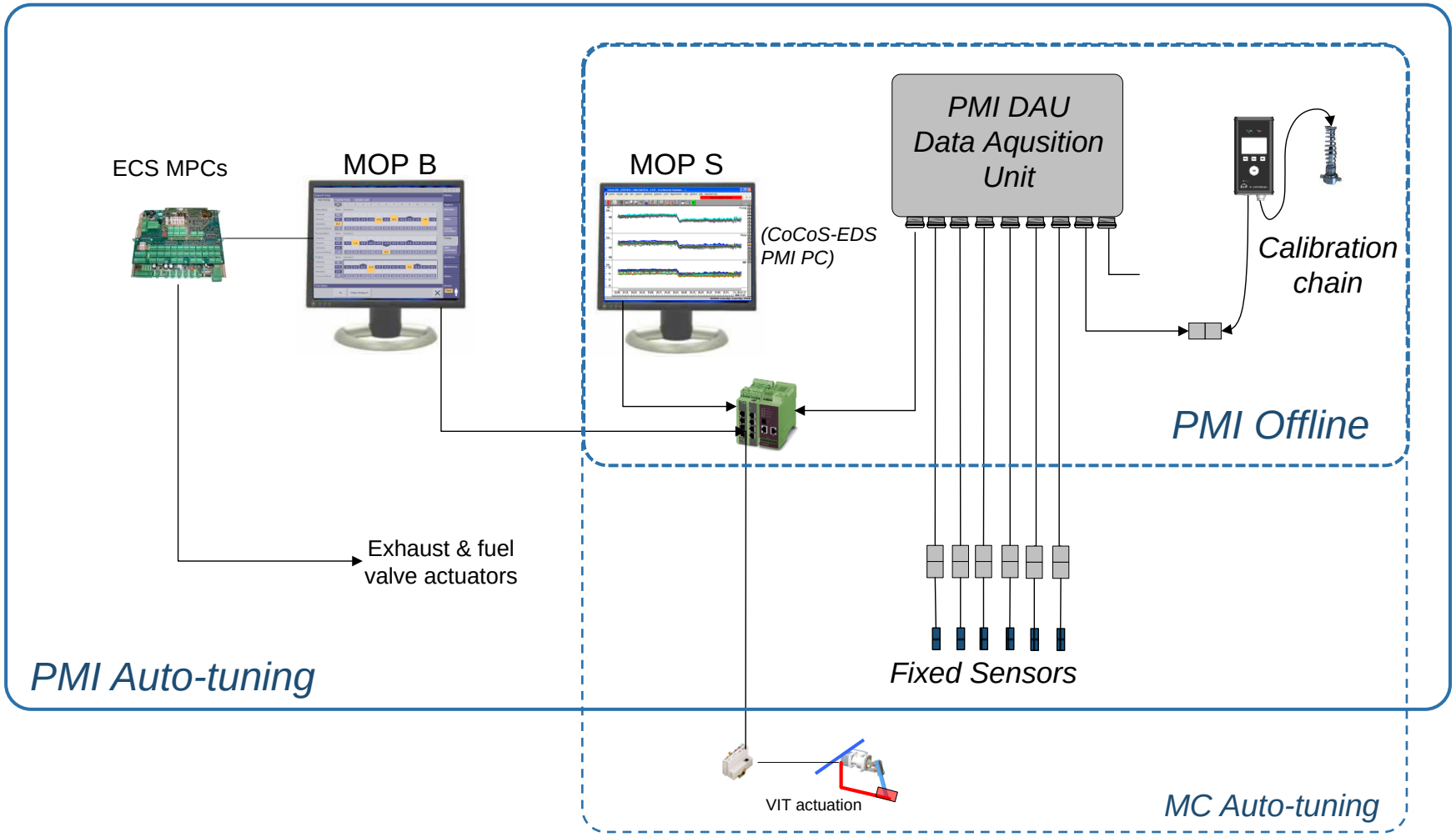


➢CoCoS-EDS

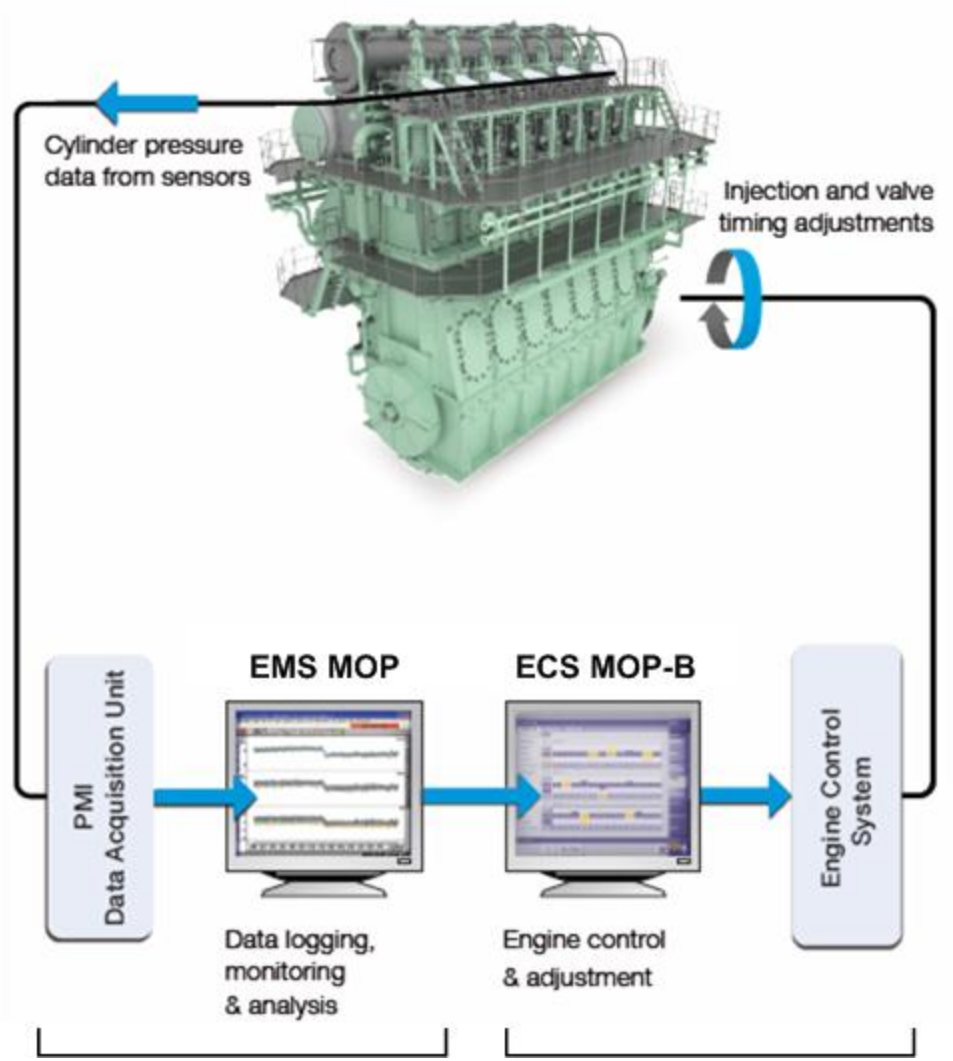
PMI Auto-tuning
Remote monitoring / AMS interface



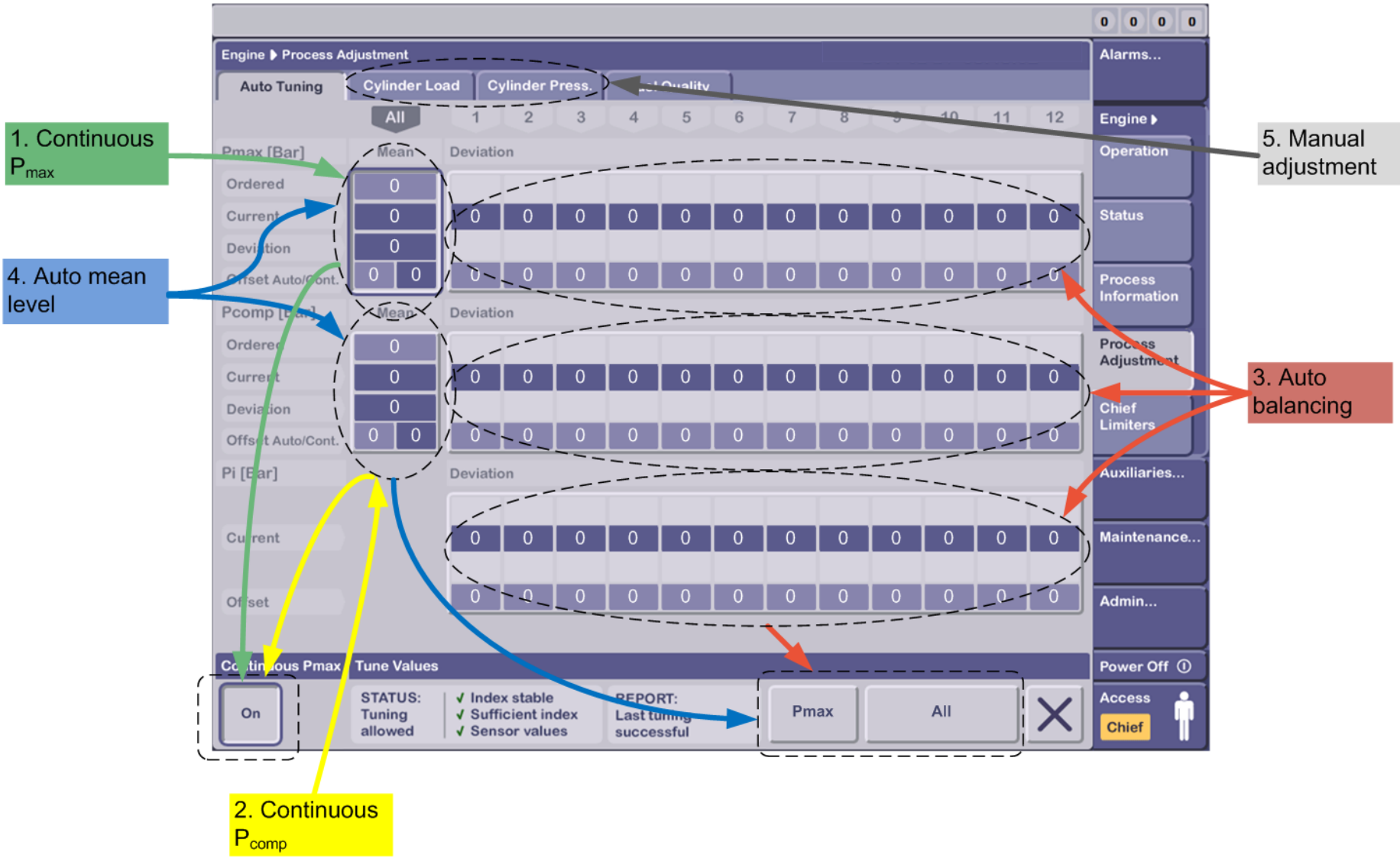
PMI Auto-tuning Family



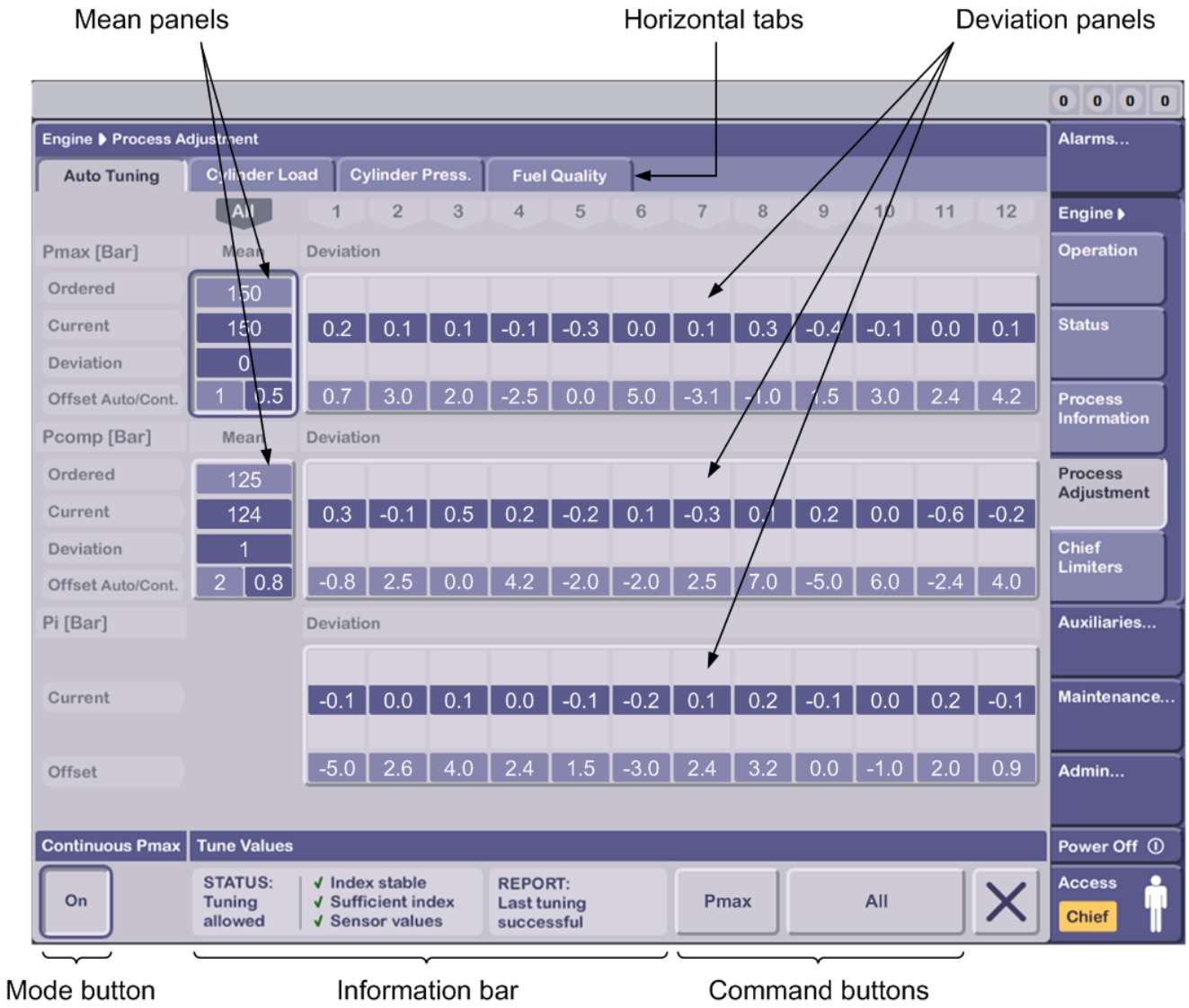
PMI Auto-tuning closed-loop tuning



PMI Auto-tuning MOP Window

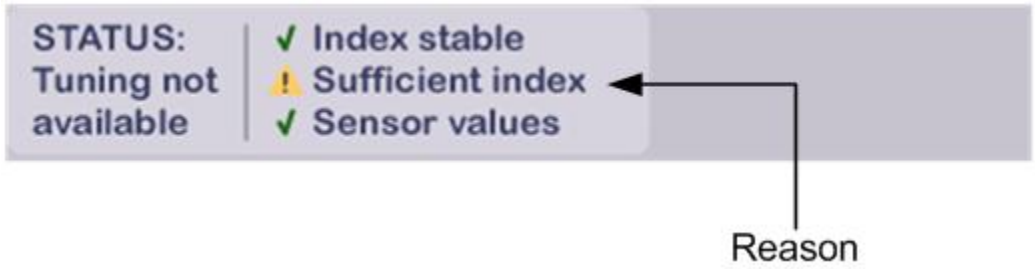


PMI Auto-tuning MOP Window



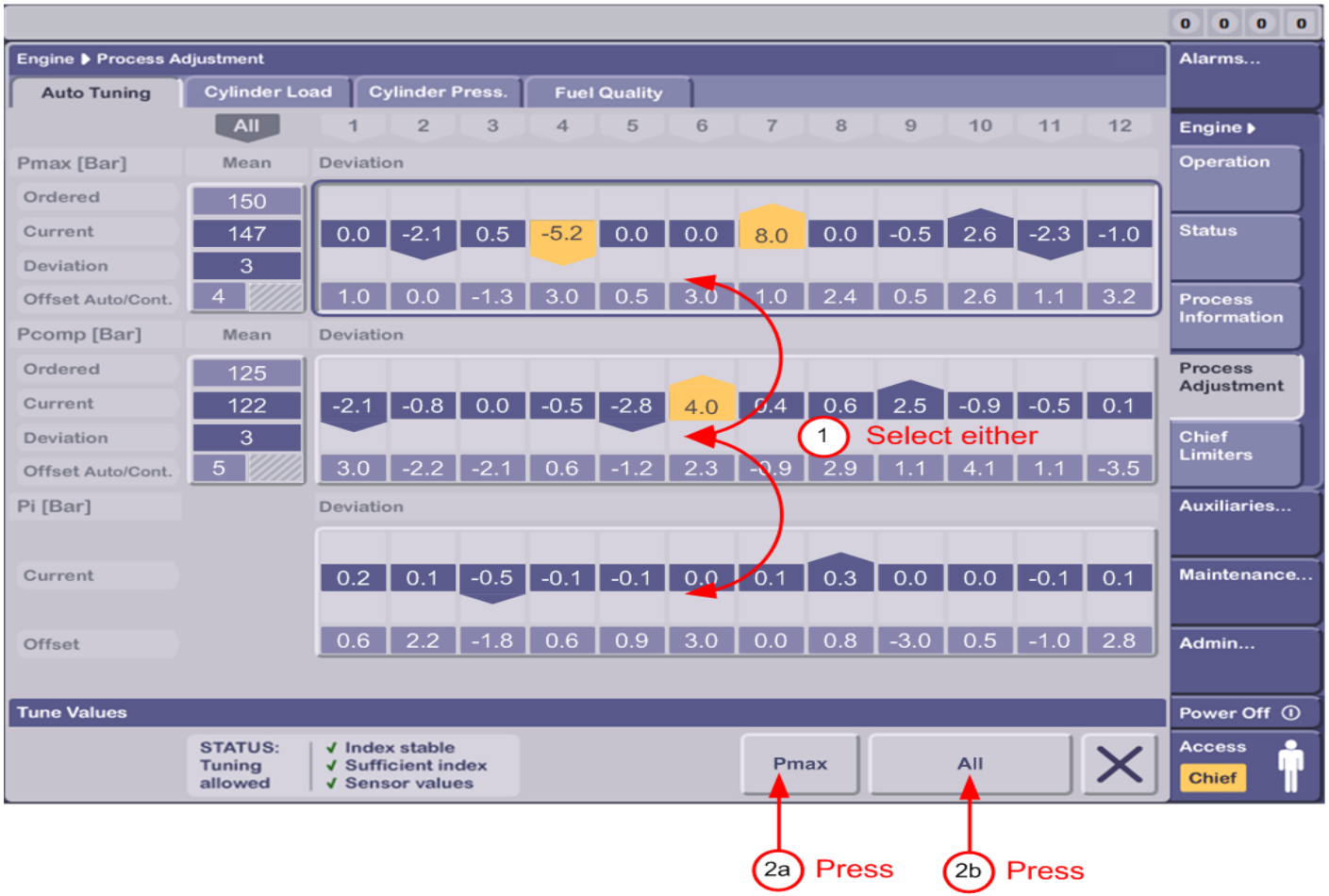
PMI Auto-tuning preconditions

Status text:
Tuning allowed - Engine is operating in the allowable tuning range.
Tuning not available - Engine is not operating in the allowable tuning range.
Tuning in progress - The engine control system is either balancing or adjusting the mean pressure levels.



Report Text:
Last tuning successful - Operator initiated tuning completed successfully
Tuning rejected due to invalid sensor values - A pressure sensor is defective or pressure values are not valid.
Tuning incomplete due to max. adjust limit - Deviation too high or above adjustable range.
Tuning rejected ECU or CCU not available - Tuning cannot be made because the particular MPC device is busy with another task.

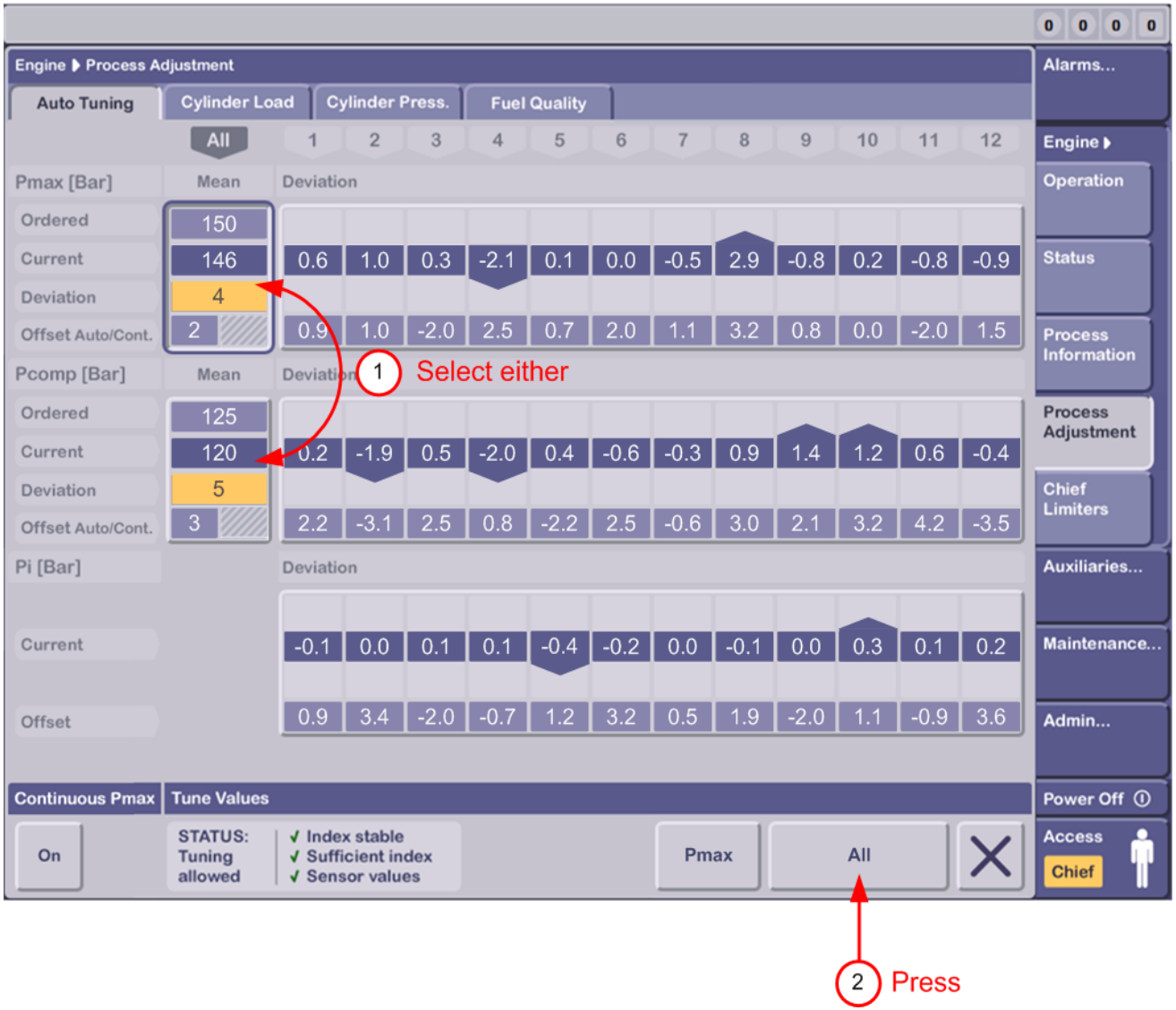
PMI Auto-tuning - balancing



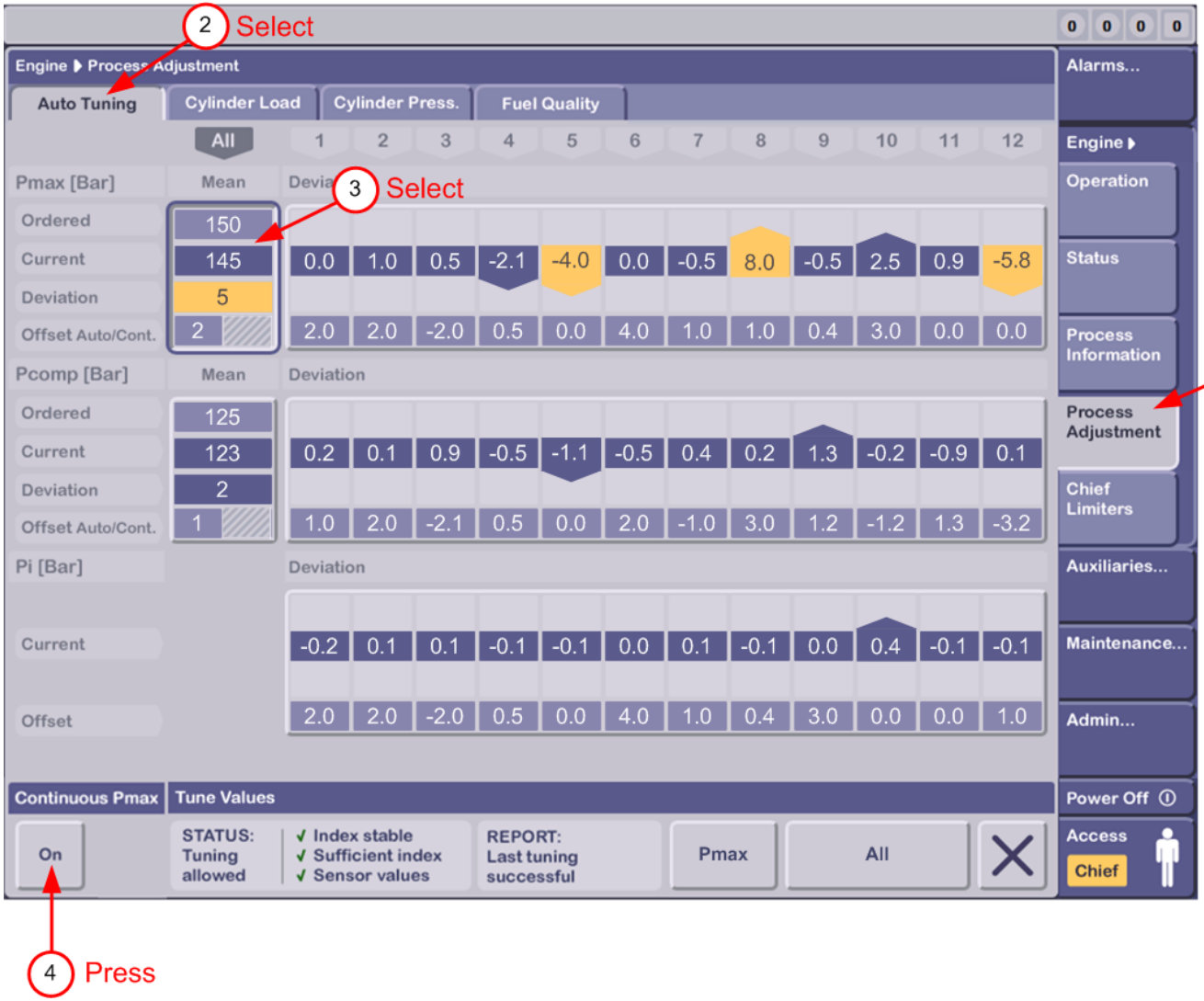
Depending on selected panel the button text (2a) will change – Pmax, Pcomp or Pi

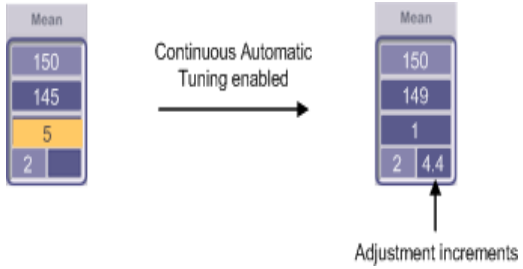
Select the All button (2b) to simultaneously balance Pmax, Pcomp and Pi.

PMI Auto-tuning - mean adjustment



PMI Auto-tuning – continuous tuning





1 Press

- Adjustment limits – pmax
- +5bar/-10bar

- Adjustment limits – pcomp
- +2bar/-2bar

Alarm limits:

Pmax deviation from avg – 10bar

Pcomp deviation from avg. – 10bar

Pi deviation from avg. – 2bar

Pmax supervision – 10bar

Prise supervision – 5bar

PMI Auto-tuning benefits

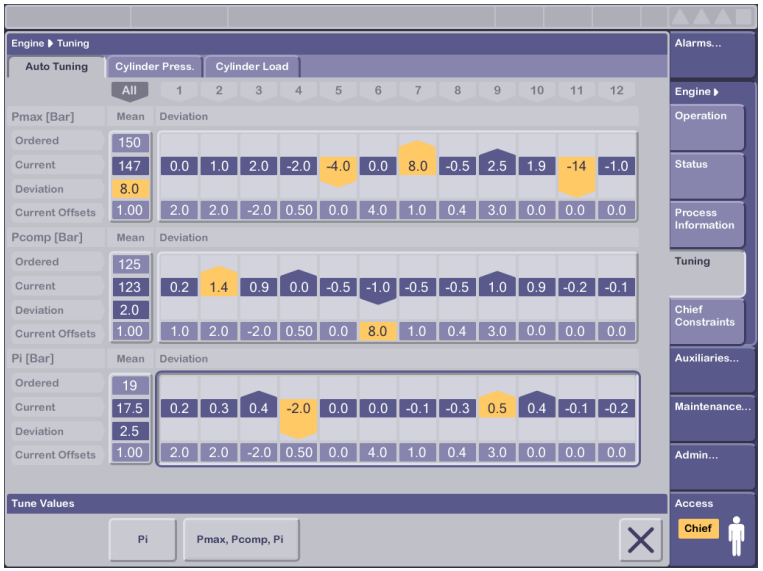
Auto-tuning overall benefits:

- Fuel oil consumption
  Reduction potential: +3 g/kWh
  Reduction average: 1 g/kWh

- Low installation costs
  Payback period estimated 6-15 month's

- Emission
  $C0_2$ reduction

- Operation cost reduction
  Reduced engine maintenance costs,
  increased availability/reliability



- Simplified operability
  Ease workload on crew
  Ensures always well adjusted engine – Pressure rise control
  Adapts automatically to changed fuel properties

- PMI online
  Enhanced troubleshooting of combustion process

Thank You for Your Attention!

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