

Wärtsilä UNIC

Engine Control System Overview



The Wärtsilä UNIC is an embedded engine control system for Wärtsilä 4-stroke engines incorporating decades of experience, knowledge and expertise. It makes engines safe, environmentally energy efficient, reliable and flexible. The system is designed to meet the highest levels of reliability, including special measures for redundancy, fault tolerance, and first class mechanical and electrical design.

Wärtsilä UNIC:

- protects the machinery and ensures the safety of the engine room crew
- allows the smart engine to produce high amounts of power with less fuel
- is designed to suit different requirements and various ambient conditions (temperature)
- adapts to different fuels and qualities



We believe in safe, environmentally energy efficient, reliable and flexible engines

Designed for Reliability

UNIC is equipped with excellent temperature and vibration endurance, making it especially well suited for demanding engine environments. When UNIC is installed, we wire all the engine sensors and actuators to the UNIC system modules. Dedicated safety-related sensors are connected to the engine safety module (ESM).

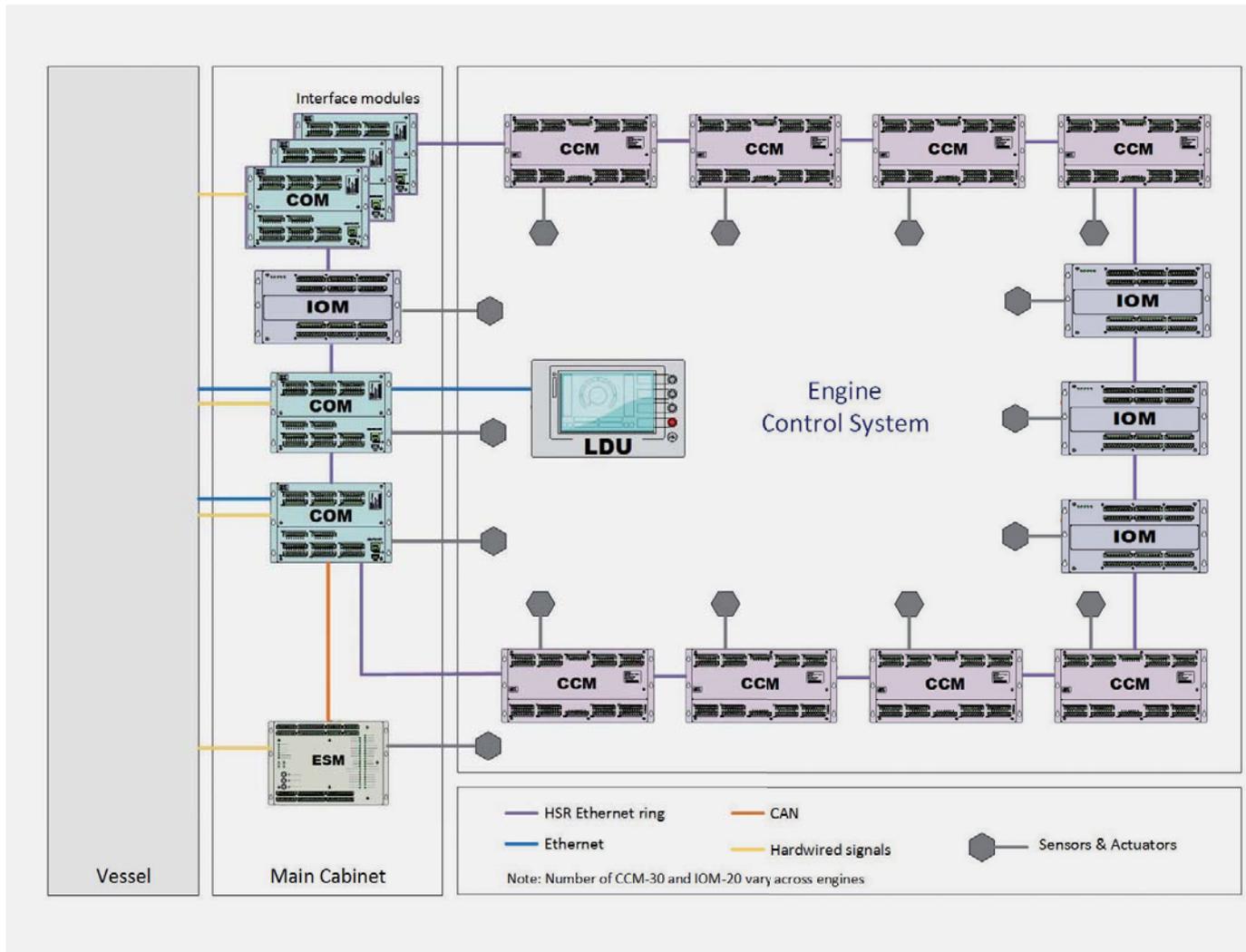
We mount electronic modules distributed on the engine in Wärtsilä terminal boxes (WTB) to facilitate all interconnections on the engine. The enclosures are equipped with cable glands. We only use well insulated, point-to-point cables, because they offer the best protection against electrical disturbances, high mechanical forces, chemicals and heat.

Designed for Modularity and User-Centricity

UNIC's rugged design allows the system to be directly mounted on the engine, thereby achieving a compact footprint without the need for mounting components in dispersed external cabinets or panels. It also enables the engine to be fully tested at the factory before delivery.

UNIC's modular and user-centric design (e.g. rail, engine, cabinet) allows easy access to the system components for installation and serviceability. Some parts and functions within the UNIC configuration are optional, depending on the engine and the installation requirements.

Intuitive interfaces enhance user experience and reliability, also in demanding situations.



THE UNIC SYSTEM BUILDING BLOCKS

LOP – Local Operator Panel

The Local operator panel (LOP) consists of a display unit and an emergency stop button. The display unit consists of RGB illuminated pushbuttons and a touch screen, which allows the operator to visualise the engine information and operate the engine.

Key functions:

- Local/remote control selection
- Local start & stop
- Trip & Shutdown reset
- Emergency stop
- Local emergency speed setting (mechanical propulsion)
- Status information (e.g. engine modes, possible failures, event log)



COM – Communication Module

The communication module is the main gateway to the UNIC system from vessel systems, supporting multiple interfaces such as Modbus, OPC, hardwired I/O, etc. COM is a key module for UNIC system communication and responsible for several control functions, software and configuration update management. Two COM modules (located in the engine main cabinet) are typically used in the UNIC system for redundancy.



CCM – Cylinder Control Module

The cylinder control module is mainly responsible for combustion control. It monitors and controls all the injection and combustion functions, and the inlet valve timing for the cylinders. The number of modules varies according to the number of cylinders. CCM is typically located on the engine side profiles, enclosed in Wärtsilä terminal boxes (WTB).



IOM – Input/Output Module

The input/output module handles all measurements in specific areas of the engine. Modules are placed close to sensors and measurable devices. The number of modules varies according to the number of cylinders, the engine type and the application. IOM is typically located on the free and driving ends of the engine, enclosed in Wärtsilä terminal boxes (WTB).



ESM – Engine Safety Module

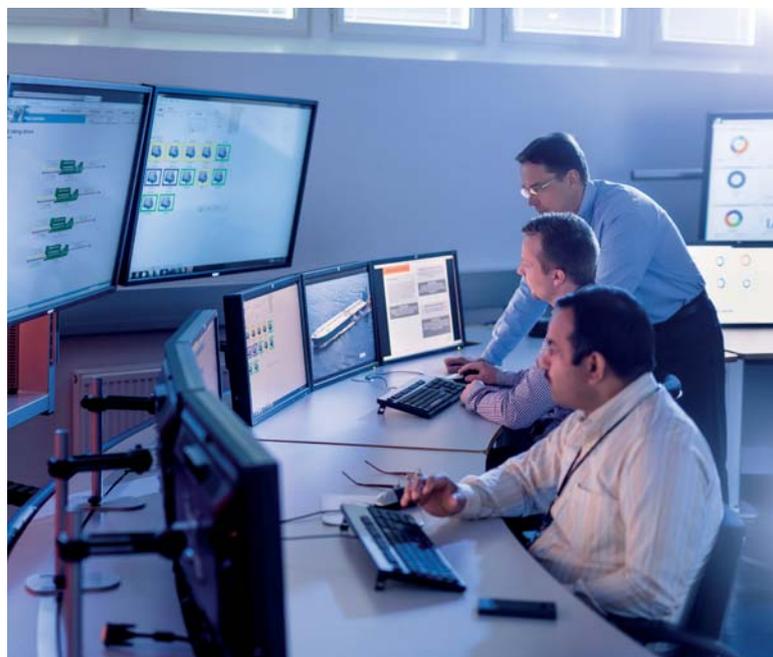
Engine Safety Module handles functions related to the safety of the crew in case of failures with engine. It provides safety functions such as shut down due to over speed or low lubricating oil pressure etc. ESM is typically located in the engine main cabinet.





UNIC enables

- record-breaking efficiency
- improved emission control (EPA / IMO Tier III)
- simplified operator interactions and advanced diagnostics to deal with unforeseen events
- protection against cyber security threats to the engine
- new value added services using digitalisation



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