C·M·R GROUP
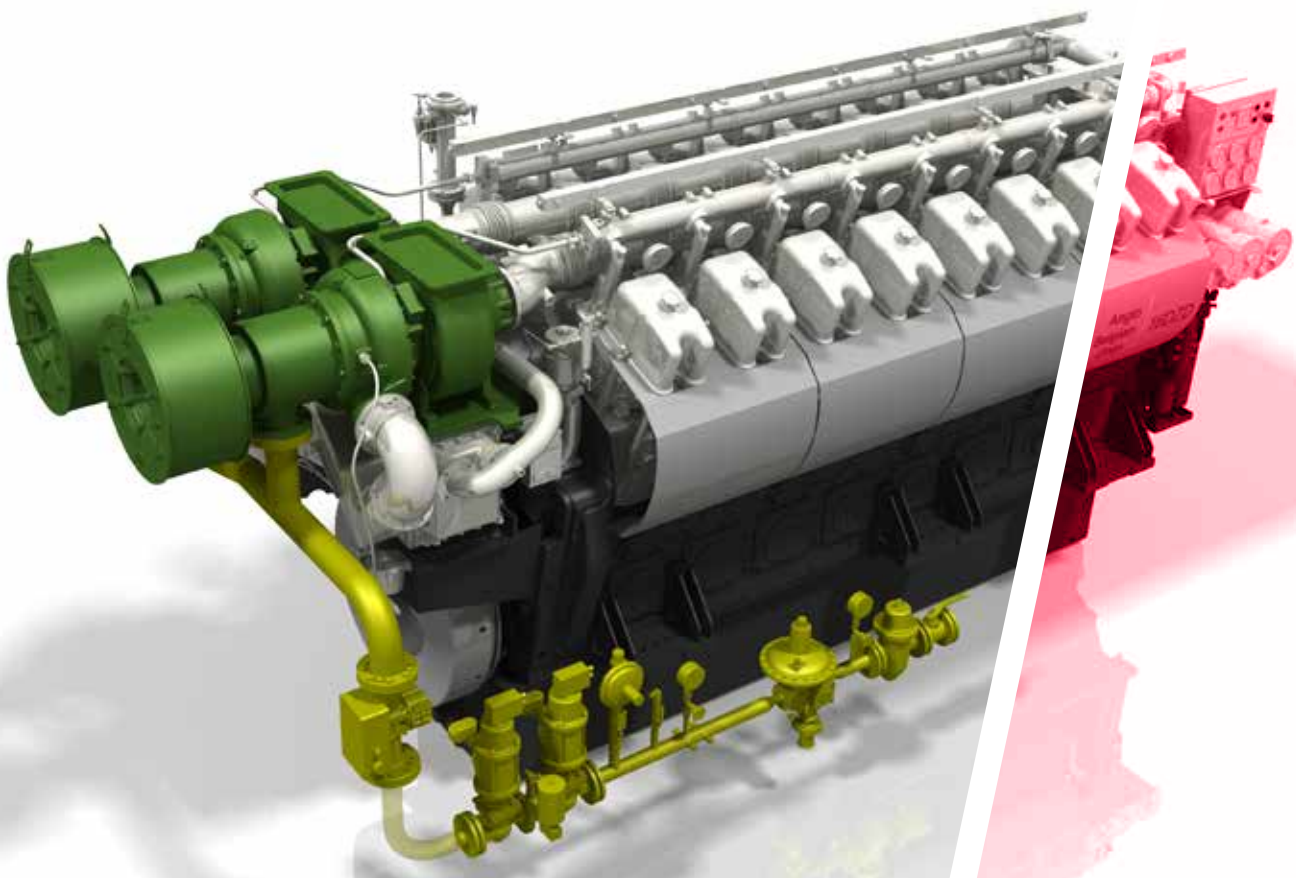
Engineered to Uncompromising Standards. *Yours*

Diesel & Gas Engine Product Guide

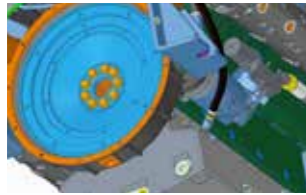Our Complete Monitoring Solution

SAW   OPTICAL   LINUX   SAE J1939

//Our complete monitoring solution

CMR
G R O U P

Systems Intergration

Custom Products

Hazardous Area

Software
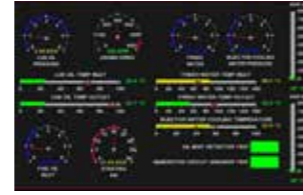
Control Panels

Alarm, Monitoring & Safety Systems

Safety Modules

Monitoring Units

Remote Monitoring

Display Units

Data Acquisition
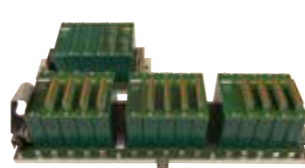
Fuel Quality

Gas Regulators

Engine Sensors

Pipe Harnesses

Wiring Systems

//Contents

//YOUR needs, our promise

- Exceeding your expectations
- Delivering you the benefits of continuous improvement & open communication
- Serving you with a 'Can Do!' process-led approach
- Caring for all people, treating everyone with dignity and respect
- Solving your challenges through a global response

Engineered to Uncompromising Standards. *Yours*
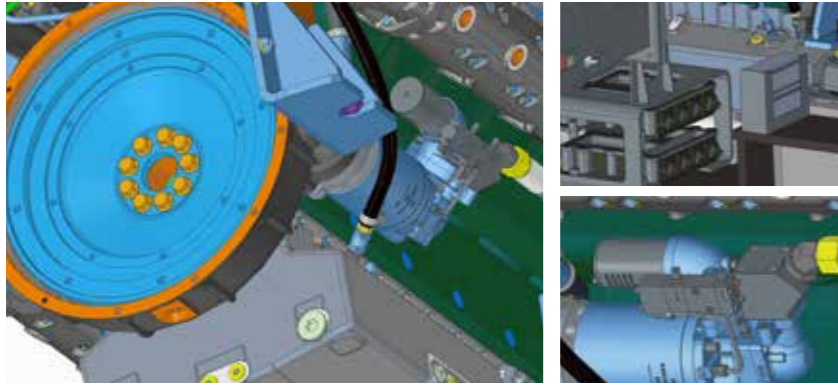
// System Integration

CREO   Windchill®   VeSys®

Your business needs access to a global network of engineering experts to provide a complete set of power management and electrical engineering solutions for engine automation, monitoring, and control.

Operating in every continent, CMR is able to offer you:

- Access to an advanced Research and Development program

- Embedded engineering design services at your site locations or independent support, using the most advanced design tools, including advanced 3D CAD/CAE plus APQP

- Rapid prototyping services

- Complete, best-cost manufacturing at CMR Group facilities

- Servicing of all products, including installation, field service and commissioning

As your engineering partner, we are committed to building your reputation for delivering high quality, cost-effective solutions.

// Custom Products

Your requirement for reliable, high quality and best-cost control and monitoring solutions is understood.

We specialize in the custom development of equipment to meet these requirements.

Your designs may need to meet specific industrial standards. We have years of experience in gaining product approvals such as CE, CSA,

IEC, NEMA, ATEX, ITAR or UL and marine classification standards including Lloyd's Register (LRS), Det Norske Veritas (DNV), Nippon Kaiji Kyokai (NKK), Bureau Veritas (BV), Korean Register (KRS), China Corporation Register of Ships (CRS), Registration Italiano Navale Azione (RINA), Russian Register (RRS), and the American Bureau of Shipping (ABS).

Working either independently or to your design and build schedule, prototypes can be developed in a local application center and transferred for production to a best-cost CMR manufacturing location.

// Hazardous Area

Your equipment regularly needs to operate in hazardous areas and meet international requirements (ATEX, CSA & UL).

We routinely develop explosion-proof products to operate safely in flammable atmospheres. Best of all, CMR can do it quickly.

Your demand for new equipment, especially in the Oil & Gas industry, has enabled CMR to develop a range of skills in specifying and building critical solutions for common engine applications.

This capability is available across our full portfolio including electronics, sensors and wiring harnesses.
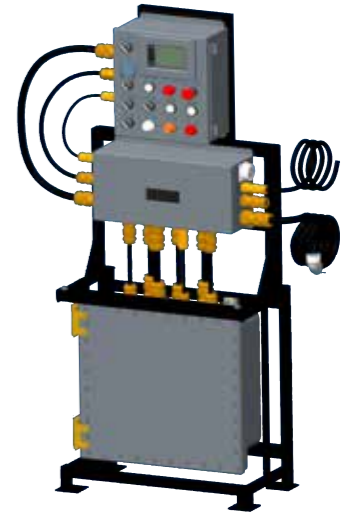
// Control Panels

Your specific applications demand optimized control.

We can accommodate any industrial need for Local or Remote control, junction boxes or electrical system interfaces.

CMR's Local Operating Panels incorporating our Smart Innovative Monitoring System, **SIMS™**, set the industry standard benchmark. Our systems process and display all user defined engine parameters, trigger local alarm outputs,

update the alarm list and store events in the log book. Built upon modular architecture, SIMS operates with one acquisition unit and one Human to Machine Interface (HMI) module.

Typically used for I/O, engine monitoring, controls, gensets, pumps, compressors, marine and other industrial applications, the unique CMR process allows us to manufacture low or high volumes, while maintaining strict

quality standards and delivery performance.

Our control panels are all about ease – integration, configuration, installation and use.

CMR is at your disposal with full design support, prototyping, on-site validation, commissioning and service.

// Software

Your systems need to be driven by market-leading intelligence and an ability to integrate with engine protocols.

Our lightweight open-source based **CLARINUX™** software using the LINUX Operating System, is an extremely cost-effective, license free solution.

CMR's software has the capability to handle key functions related to Alarm,

Monitoring and Control, manipulating data from CAN Bus (CANopen and J1939) and Modbus (RTU and over Ethernet TCP/IP) protocols.

Our systems engineering team introduces regular base-line upgrades, most recently including engine control functions such as pre-lubrication, pre-heating, engine starting sequencing and additional sensor inputs.

An added advantage of the CLARINUX software is its extendibility, particularly in a marine context. Fully approved by marine classification societies, the system receives AUT-UMS Class notation acceptance for 'Engineer on Duty' Management, dead man systems, cabins and mess rooms.

// Alarm, Monitoring & Safety Systems

Your need for reliable and time-proven alarm and monitoring capability.

Our **CLARINE™** suite of systems, available in multiple display formats, including 6.5'' and 12.1'', can handle normal requirements up to 600 channels per device. This is extendable to 2,000 channels, with the latest advances in CLARINE touch-screen hardware.

CMR's CLARINE systems perform local or general monitoring functions 24/7, 365 days a year in the harshest environments including typical 'unmanned' requirements.

Parameter selection is configurable on normal thresholds, with seamless cross-referencing to alarm conditions on other channels.

Displaying relevant on-screen monitoring information

transmitted via the bus network, analogue channels are handled with various graphic visualisations including bar graphs, dial type indicators, digital readouts, historical curves and bi-dimensional maps.

Aligned with CLARINUX software, CMR's CLARINE range offers powerful and extendable solutions fully approved by the main Marine Classification Societies.

// Safety Modules

Your applications demand safe control.

Our safety modules monitor over-speed and mandatory requirements such as low lube oil pressure and high cooling temperature in order to ensure correctly operated engine shutdown.

CMR's safety modules meet the stringent requirements of the Marine Classification societies.
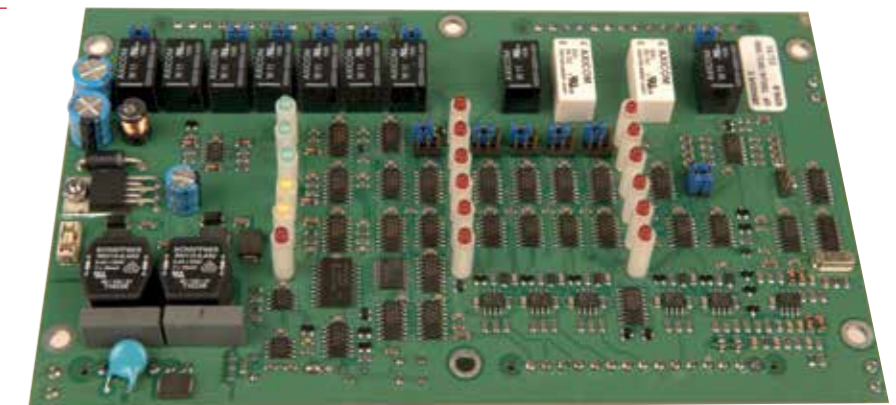
// Monitoring Units

Your need for flexible and cost-effective monitoring solutions has increased due to new control and emission regulations.

Our monitoring solutions offer you that flexibility.

CMR's **MS™** module range, designed as plug type terminal blocks for use on local DIN Rails provide monitoring, insulation and power supply functions,

while our tried and tested **S-series™** units offer stand-alone multi-channel monitoring in a small form factor.

Our MS modules convert Pt100, thermocouple and voltage inputs into 4-20mA signals, providing local power while also insulating signals and applying current and voltage threshold limits.

//Remote Monitoring

Your critical assets are operated at remote locations.

Our solutions work through **Monico Gateways™** and via 4G, 3G, Ethernet, GSM and GPRS network solutions to provide access at your fingertips. This offers you the security, reliability and flexibility to take command of your installations 24/7.

CMR's strategic partnership with Monico Monitoring Inc. ensures the delivery of pre-configured, easy to use monitoring solutions for industrial engines, generators and gas compressors as well as associated equipment.

Monico Gateways are simple to install and have capabilities such as real-time data logging,

email and SMS alerts that allow users to monitor, diagnose and troubleshoot from any location, worldwide.

Our engine monitoring solutions allow professionals in the oil & gas, power generation, data center, mining and marine industries to save thousands in hardware and programming costs.

//Data Acquisition

You need to gain data from various analog and digital measuring inputs.

Our Smart Connecting Module (**SCM™**) converts and digitizes analog and binary inputs into CAN, Double CAN Bus and CAN Open protocols.

CMR's SCM modules manage all the normal channel

monitoring functions such as sensor break, insulation fault and scale overlaps.

Intended for installation on a DIN Rail, our SCM approach is a compact plug and play solution, offering superior capacity, flexibility and cost-effectiveness.
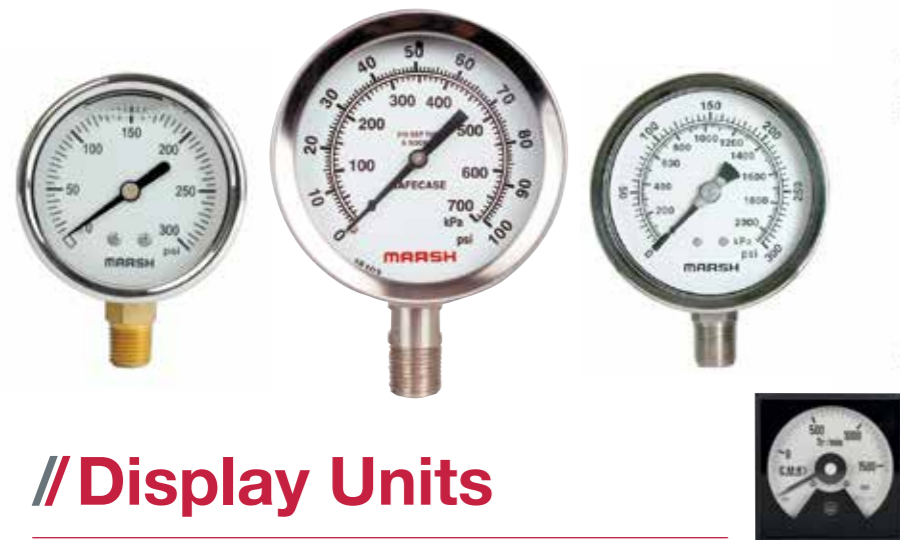
//Display Units

Your engineering end users demand visual monitoring of critical functions.

Our LCD displays and analogue indicators for temperature, pressure and rev counting provide you with that clarity.

CMR's Local Display Units (**LDU's™**) have been developed to perform two main functions - alarm reporting and responsibility transfer.

These features are mandatory for operating in Unattended Machinery Space (UMS) environments.

The LDU's communicates with the supervision software in an RS485/RS422-type network architecture using the MODBUS RTU communication protocol. The communication interface can be configured in RS232 to perform a point-to-point connection.

CMR's LDU's are mechanically designed to have a minimal form factor, with full approval for marine environments and optimization for use with CLARINUX software.
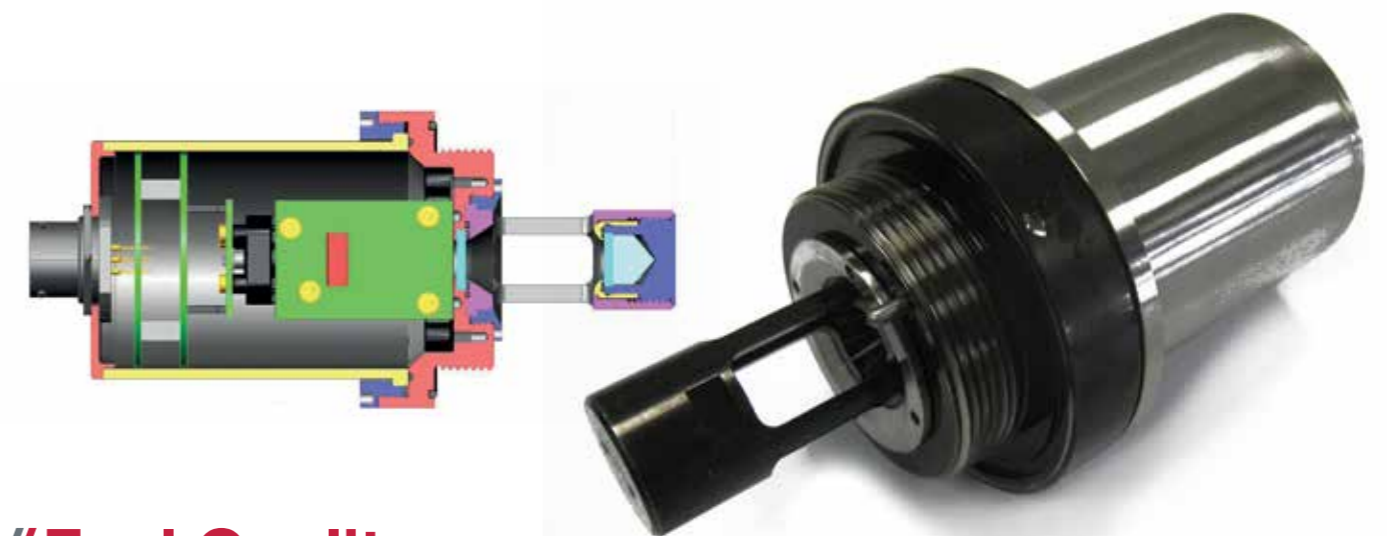

//Fuel Quality

Your systems may be subject to variable fuel quality at remote locations. Our world leading and patented, NIRIS™ Near Infra-Red Intelligent Sensor provides spectral analysis on critical fuel information.

CMR's **NIRIS™** Diesel sensor can continuously measure the cetane index, density, percentage of biodiesel and HCP content. Combined with an ECU, NIRIS technology

is designed to reduce fuel consumption and pollutant emissions. Installation can be at any location between the low pressure and high pressure fuel pump.

The NIRIS suite offers compact sensing technology, powerful embedded software and typically operates with no moving parts.
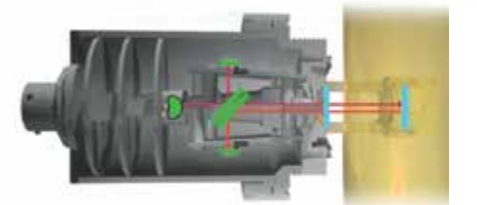
// Gas Regulators

Your gas engines require cost-effective fuel regulation.

Our range of direct acting and pilot regulators, offer the most cost-effective component solution.

CMR's P series regulators, most commonly in P99, P143, P200, P289 and P600 configuration offer various relieving, monitoring and pressure shut off options. These regulators are complemented by a wide range of ancillary gauges and valves.
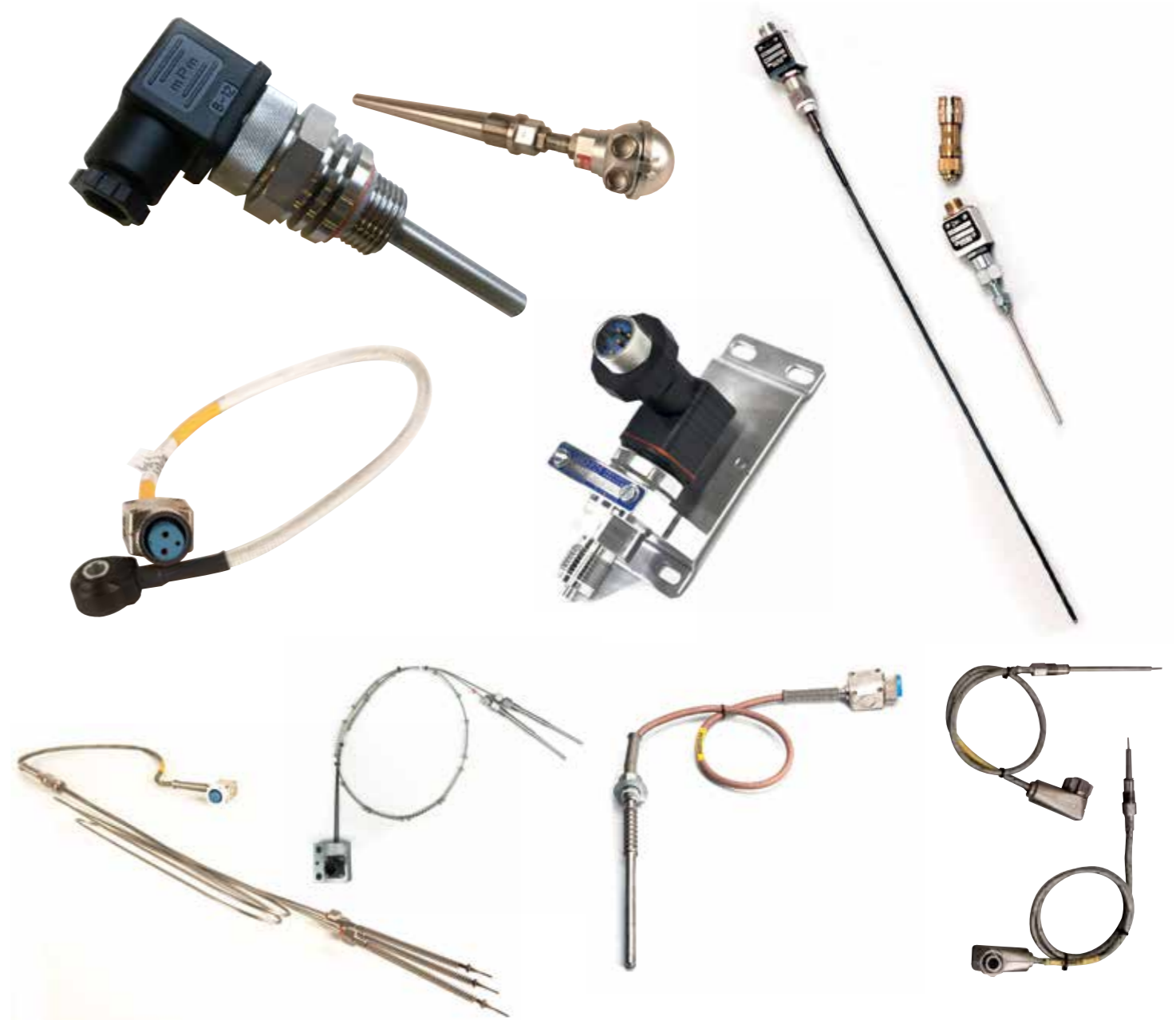
// Sensors

Your desire to work with a sensor expert.

Our range of specialized engine sensors is the most tried and tested in the global engine and rotating machine market.

Our knowledge of sensors spans 50 years, all tested and referenced by the world's largest engine and equipment manufacturers on every developed continent. CMR's deep understanding of engine platform requirements include elegant solutions deployed inside the crank case using wireless technology.

CMR offers specialized thermocouple / temperature sensors and pressure sensors to meet your exact requirements:

- Ambient (AMB™)
- Charge Air (MBT™)
- Combustion Chamber (MTC™)
- Cylinder Liner (MTCH™)
- Exhaust Gas & Turbo Compressor (ETS™, MD™, MC™, EGT™)
- Exhaust Valve (MTS™)
- Fuel Quality (NIRIS™)

- Fluids (LTS™, MBT™)
- Knock (CNV™)
- Large End Bearing (BTS™, TB3™)
- Main Bearing (MP™)
- Pressure (P™)
- Rotating Machine Bearings (BC™, BS™)
- Smart J1939 Sensors (J-SENSE™)

From standard thermocouples to advanced sensors with embedded J1939 technology, CMR has it covered.
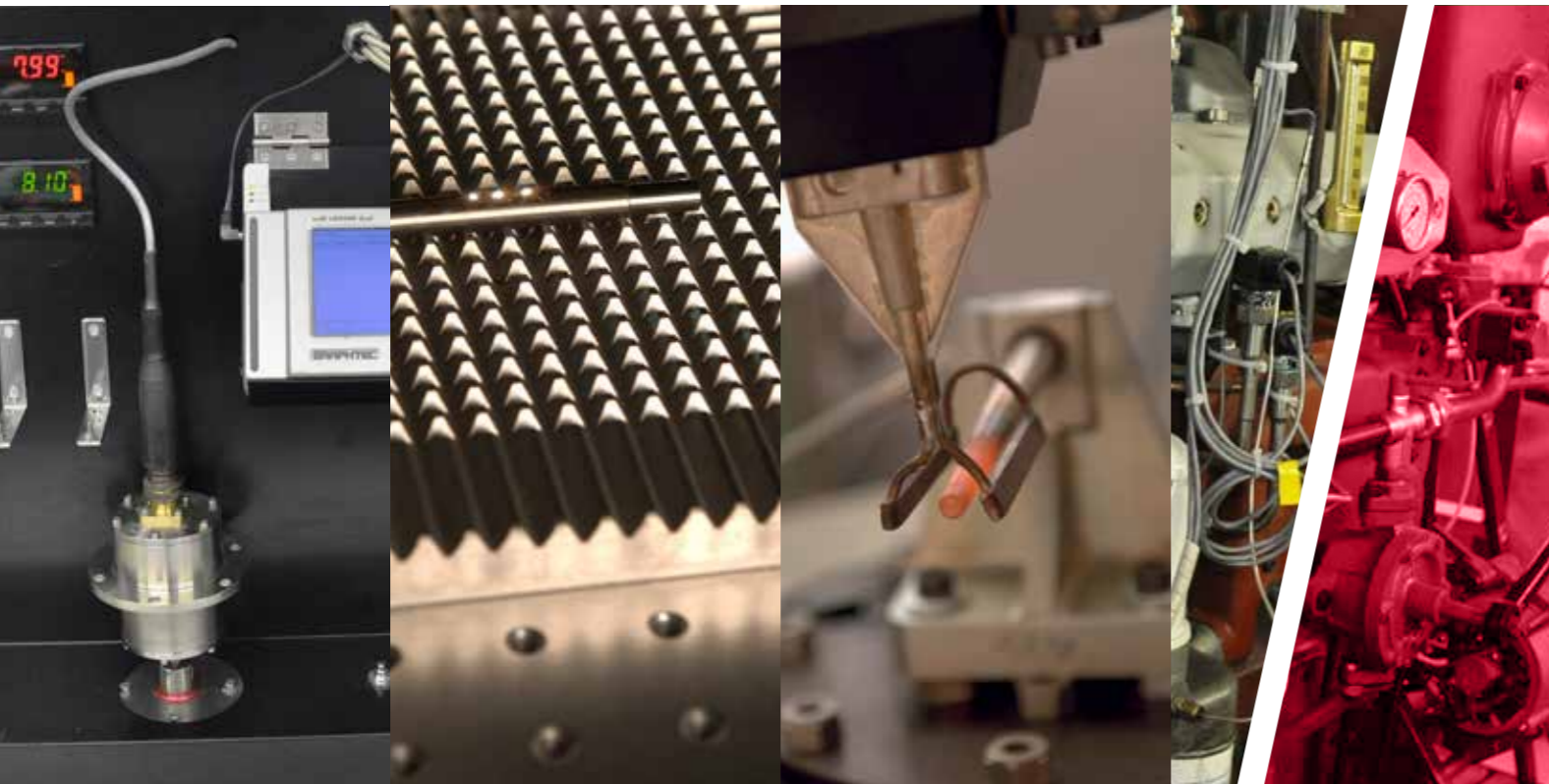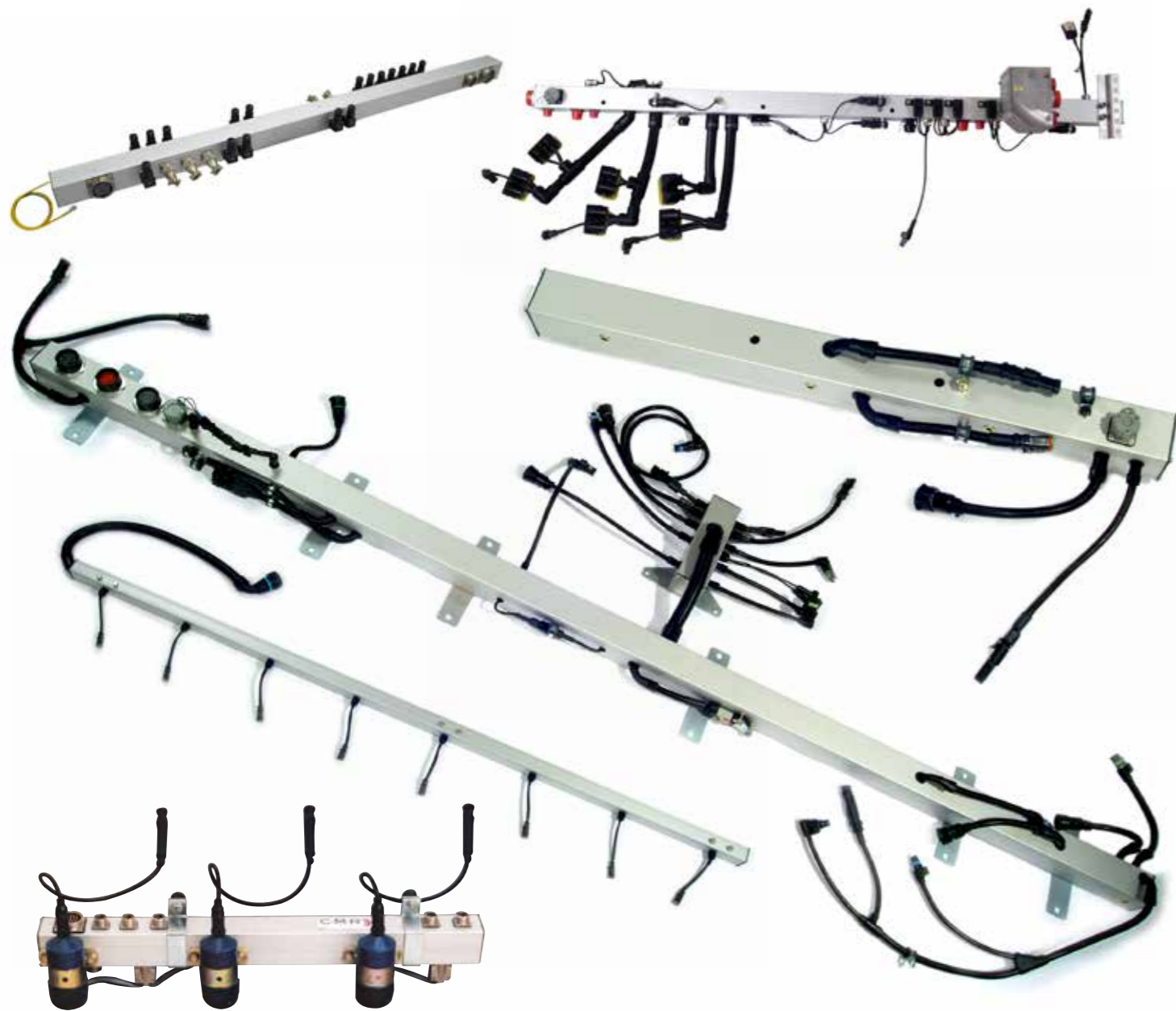
//Pipe Harnesses

Your ability to perform is based on a need for absolute reliability. Our **PIPEHarness™** systems, first patented in 1972, set the global industry standard for robustness.

Enclosed within aluminum profiles, the CMR PIPEHarness encapsulates and protects your critical wiring like no other harness on the market.

Our pre-cabling systems are used both externally on the engine platform and internally within the crank case. The range includes:

- Thermometric & Pyrometric pipes (CT™, CPT™ & CTT™, PRY™)
- Inside Crankcase Thermometric pipes (CTC™)
- Complex & Multi-Service (CAW™, CPW™, MSP™)
- Non-Rigid, flexible plug and play pipes (NR™)
- Patented Ignition Pipes for Gas engines, including Coils and Pulse transmission (CAL™, CAC™, CMB™)
- Smart Connecting pipes using CAN open, J1939 protocol (SCP™)

CMR's PIPEHarness approach improves aesthetics, reduces cost of installation (TAKT time) and negates the chance of sensor inversion upon connection.

As you would expect, many systems are also UL, CSA and ATEX classified, while adhering to marine approval standards.

//Wiring Systems

Your engines require a wide range of pre-cabled solutions. Our class-leading range of flexible harnesses can meet your every requirement.

CMR uses a wide variety of production technologies in order to manufacture and test any type of system or ancillary component, including:

- Braided harnesses
- Cables & Inter-Connects
- Conduit harnesses
- Flexible harnesses
- Wire & Taped harnesses

We bring 50 years of experience to your projects and have thousands of reference part numbers with engine and genset manufacturers throughout the world.

About CMR

YOUR global engineering partner.

Our proud heritage has navigated us from the shipping channels of Marseille, France towards all the major global industrial hubs.

With some of the first patents for marine electronics and ground-breaking technology transfers, to the latest in green innovation

for industrial fuel systems, CMR Group has consistently delivered you quality and reliable products for decades.

Our systems are found far and wide. From the oil and gas fields of Texas to the mine trucks of South America and the bustling ports of Asia, our supremely

engineered solutions perform 24/7, 365 days a year in your harshest environments.

CMR's quality accreditations include ISO 9001, TS16949 ISO 14001 & OHSAS 18,001.

We offer true quality, true reliability as your global engineering partner.

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