



Gianluca Saccon Sandro Maluta

**Headquarters: Via Oberdan, 70
70043 Monopoli (BA), ITALY**

Tel. +39 080 9171

Fax +39 080 9171 112

www.mermecgroup.com

A worldwide leading **Transportation and Aerospace Group**

SYNERGIC HIGH-TECH COMPANIES WITH
750+ HIGHLY SKILLED EMPLOYEES



Angelo
Investments



MERMEC group

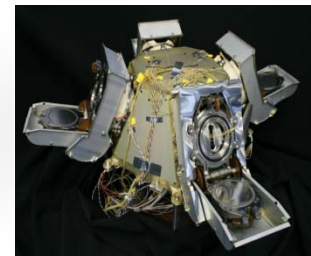
RAILWAY



AEROSPACE



AEROSPACE



BLACKSHAPE

AVIATION



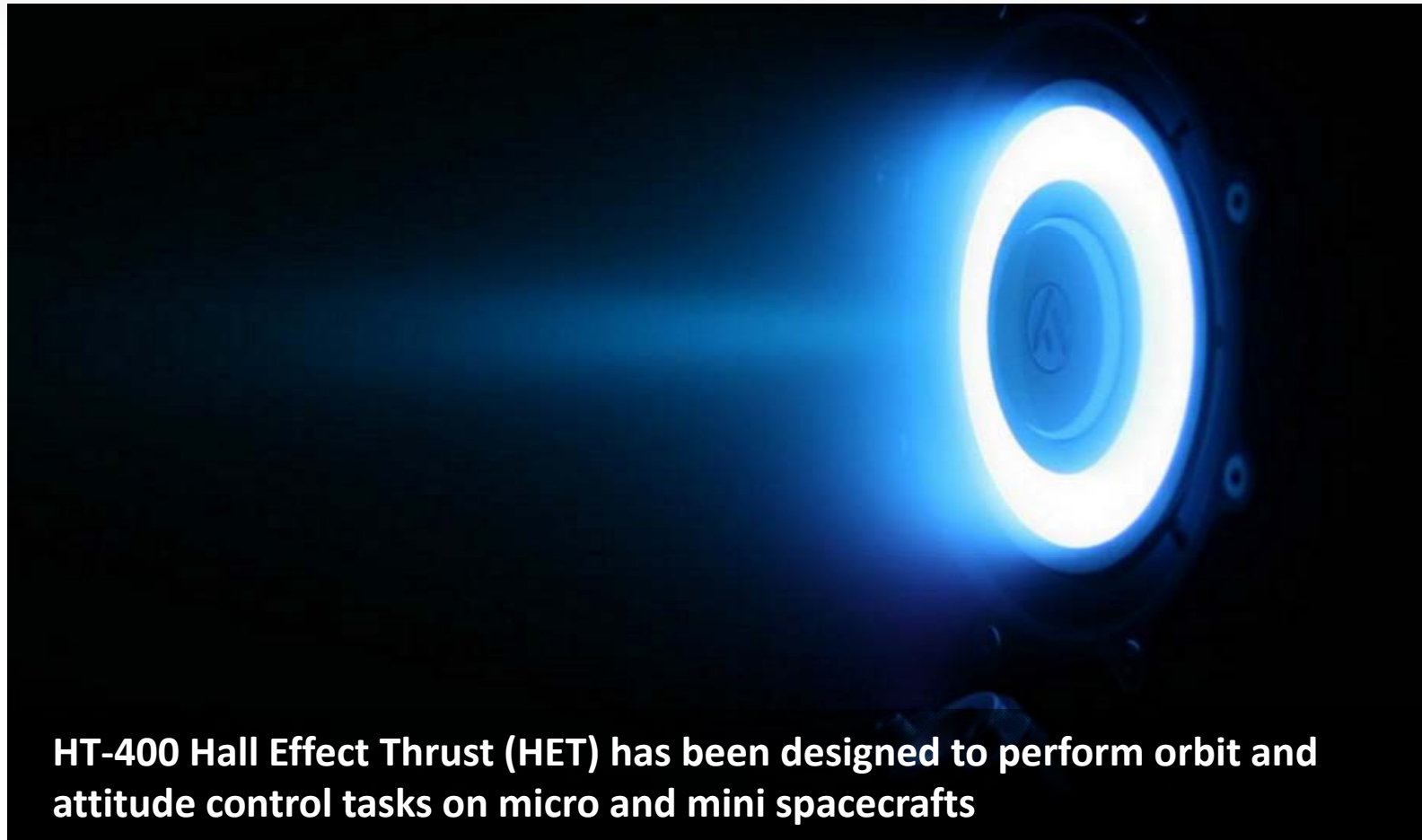


SITAEL S.p.A.
Modugno (BA), ITALY
Pisa, ITALY
www.sitael.com

Microsatellite Systems, Payloads, Instruments and Sub-equipments



Space electric propulsion, chemical propulsion and aerothermodynamics



HT-400 Hall Effect Thrust (HET) has been designed to perform orbit and attitude control tasks on micro and mini spacecrafts



BLACKSHAPE S.p.A.
Monopoli (BA), ITALY
www.blackshapeaircraft.com

High performance carbon fiber aircrafts for sport and pilot training

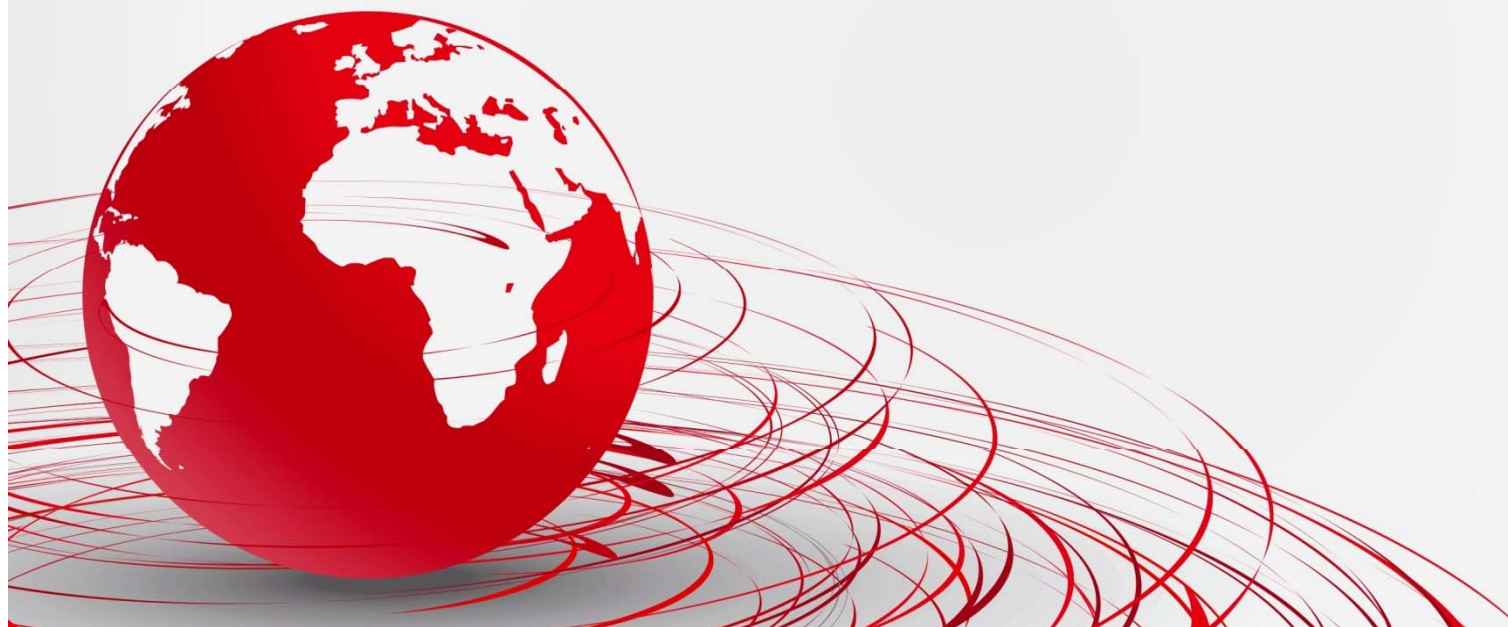


**Best Aircraft of
the world 2013**

THE WORLD FASTEST AIRCRAFT IN UL CATHEGORY

MERMEC Group

Company profile



About MERMEC Group

- **World's leading supplier** of integrated solutions for railways infrastructure inspection and automatic train protection



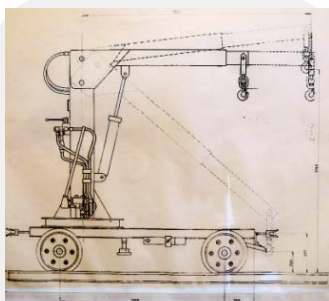
DIAGNOSTIC VEHICLES AND SYSTEMS



SIGNALLING SYSTEMS

“We help railways worldwide to increase safety saving time and money”

History timeline



1960's

STARTING
BUSINESS



MAINTENANCE VEHICLES

1980's

ENTERING THE
RAILWAY MARKET



NO-CONTACT MEASURING
SYSTEMS

1990's

PIONEERING THE
OPTOELECTRONICS



AUTOMATIC TRAIN
PROTECTION & CONTROL
(ERTMS)

2000's

BREAKING INTO THE
SIGNALLING MARKET



CONVERGED SIGNALLING
AND INSPECTION
SOLUTIONS

today

DIAGNOSTICS MEETS
SIGNALLING

“A proud tradition of innovation”

International facilities



**MERMEC
HEADQUARTERS**
Monopoli, ITALY



MERMEC Inc.
Columbia, USA



TECNOGAMMA
Treviso, ITALY



MERMEC FRANCE
Marseille, FRANCE



MERMEC UK
Derby, UK



MERMEC TURKEY
Ankara, TURKEY



MERMEC CHINA
Beijing, CHINA

NEXT OPENING IN 2013

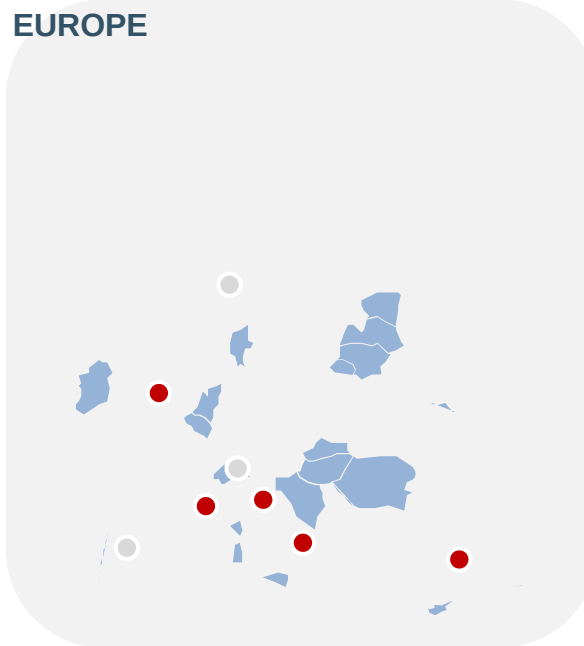
- MERMEC INDIA
- MERMEC AUSTRALIA

REPRESENTATIVE OFFICES ●

NORTH AMERICA



EUROPE



ASIA & OCEANIA



“13 sites following 140+ clients in 45 countries”

Some customers

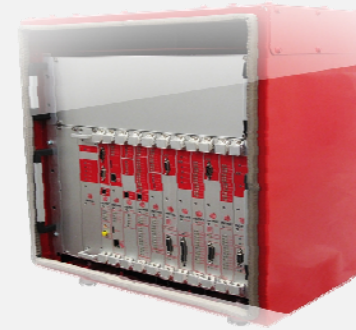


“All market segments served, from high-speed to rapid transit”

Core competence & know-how



INSPECTION & MEASURING
SYSTEMS



SIGNALLING SYSTEMS



DECISION SUPPORT SYSTEM

- **ALL IN-
HOUSE**
- from design
to
manufacturing



MEASURING RAILWAY VEHICLES

“High quality, seamless integration, unique user-experience”

Innovation in our DNA

- Pursue strategic research programs paving the way for future technologies

10% of revenue invested
annually in R&D activities



12 international awards and honours



“The most awarded Italian company in Innovation”

Photonics Prism Award 2012



Mary Lou Jepsen (CEO Pixel Qi) awards Luca Ebreo (President MERMEC USA)



San Francisco, USA
January 25, 2012

**MERMEC Group receives
the prestigious
“Oscar of Photonics” 2011
for T-SIGHT 5000 Tunnel
Wall Inspection System.**

MIT - Technology Review



Massachusetts
Institute of
Technology

Boston, USA
October 2012

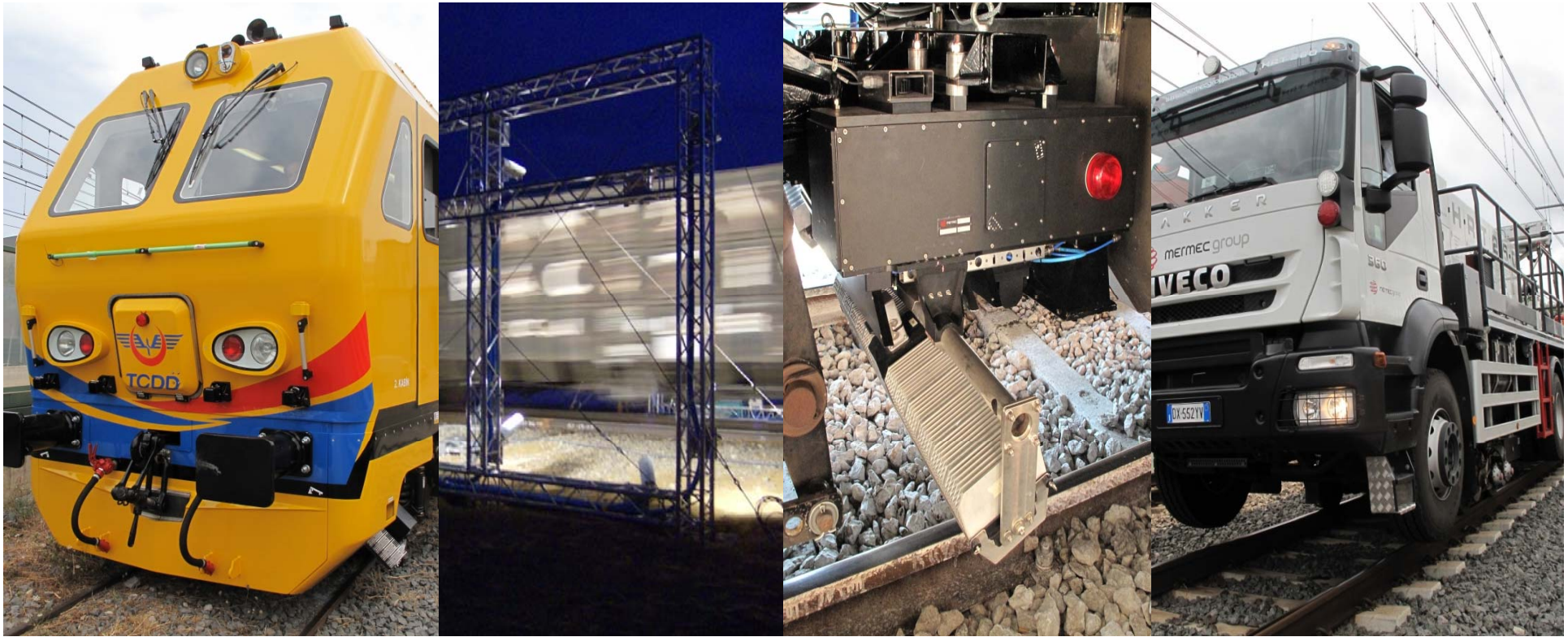
Technology Review, the official MIT's
magazine about innovation, selected
MERMEC T-Sight 5000 as

**one of the 50 most
innovative solutions
able to change the world**

EC awards 2 high tech companies for their excellence in innovation among 50 world's case studies



The latest MERMEC innovation award
Bruxelles - **January 28, 2013**

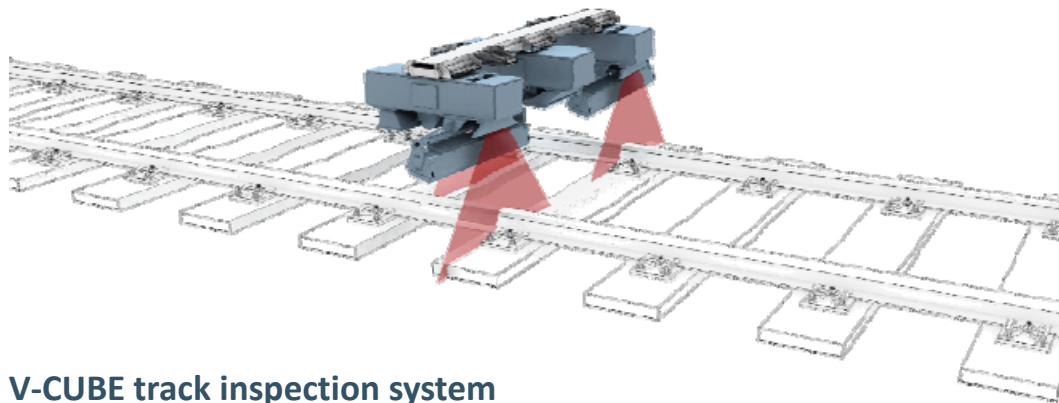


Business strategic area

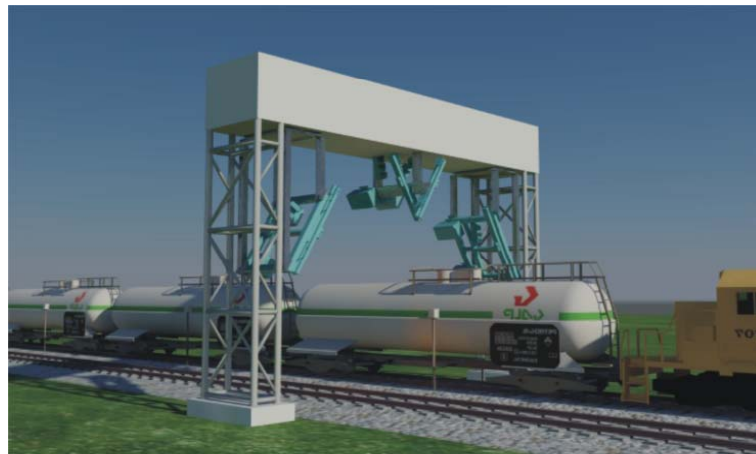
Diagnostics

SYSTEMS, VEHICLES & MEASURING SERVICES

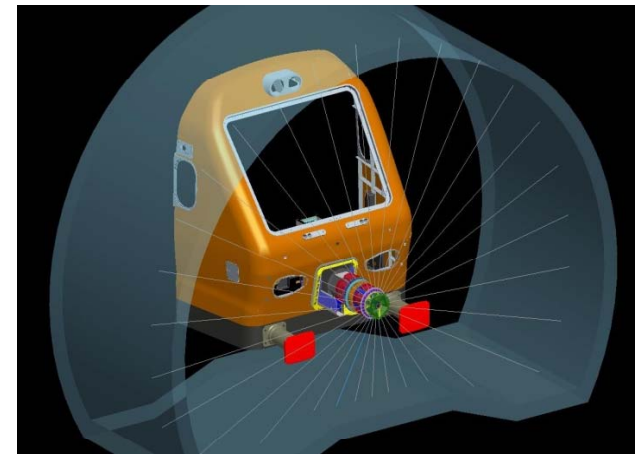
Some railway measuring and inspection systems



V-CUBE track inspection system



SIL 4 train inspection portal



T-SIGHT 5000 tunnel inspection system

Multipurpose Recording Cars



ROGER 300
NORWAY



ROGER 400
SYRIA



DR. FIND
SOUTH KOREA



ROGER 1000 K
SOUTH KOREA



ROGER 1000
NORWAY



ROGER 400
TURKEY



ROGER 1000 SBB
SWITZERLAND



CARONTE
ITALY



ROGER 800
TURKEY



ROGER 800
AUSTRALIA



ROGER 800
AUSTRALIA

“The only global supplier able to design and manufacture railway vehicles and measuring systems”



Business strategic area

Signalling

AUTOMATIC TRAIN PROTECTION AND CONTROL SYSTEMS

Signalling system

ONBOARD SUBSYSTEM

Main components



MMI



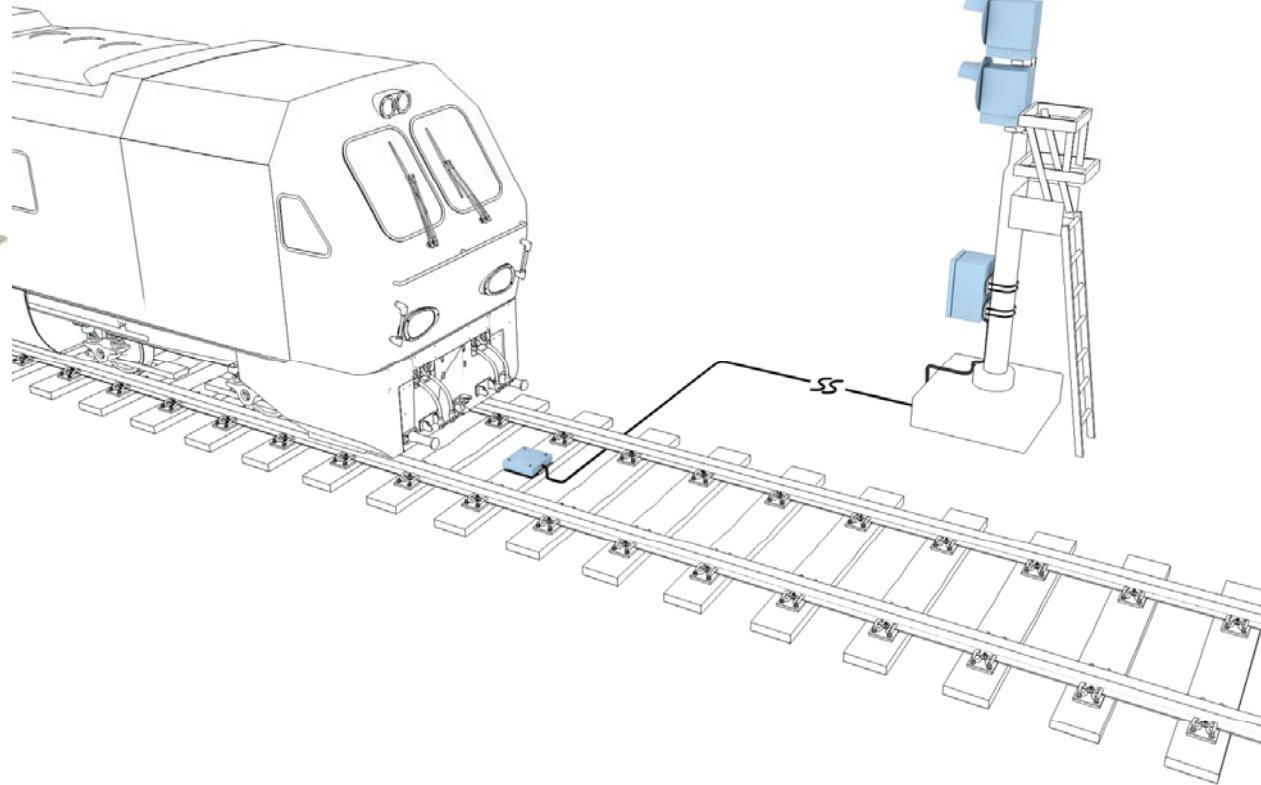
BTM



EVC



Balise Antenna



WAYSIDE SUBSYSTEM

Main components



Signal LEU



Interlocking LEU



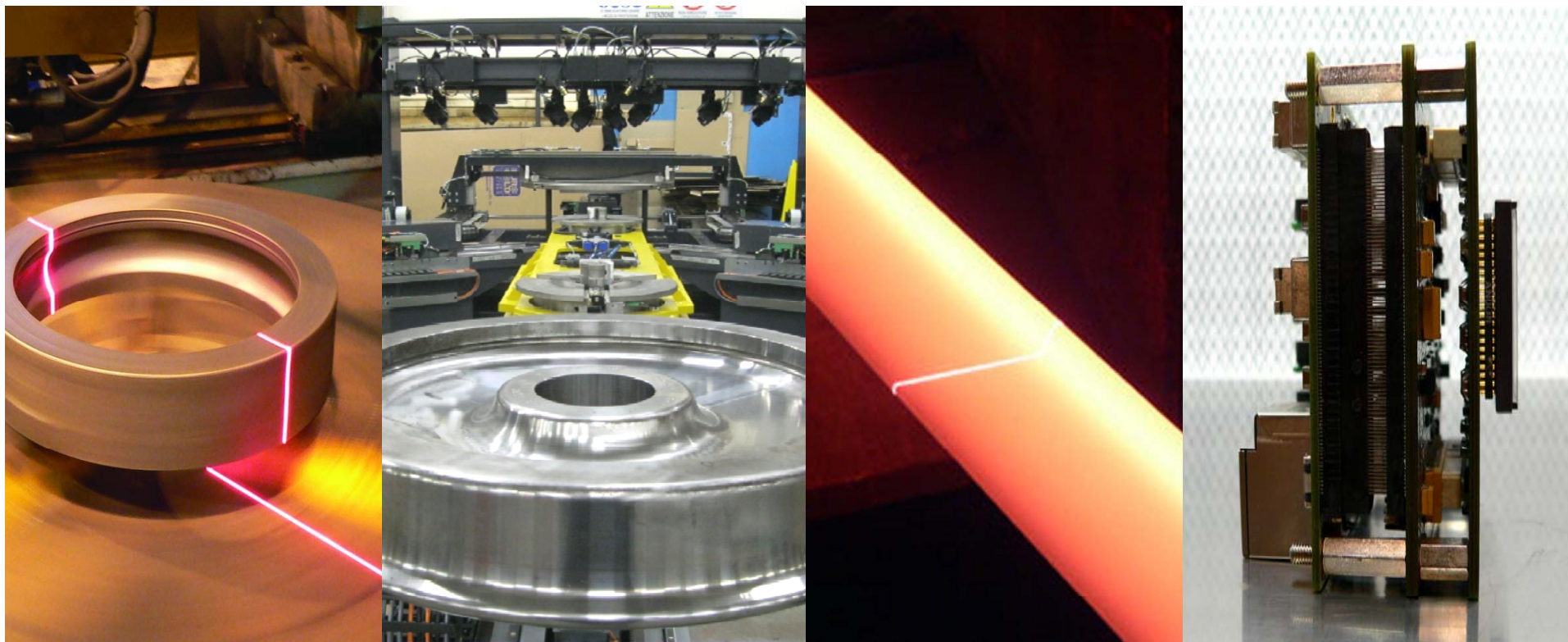
Eurobalise

MER MEC associate member of

UNISIG consortium



UNISIG



Business strategic area

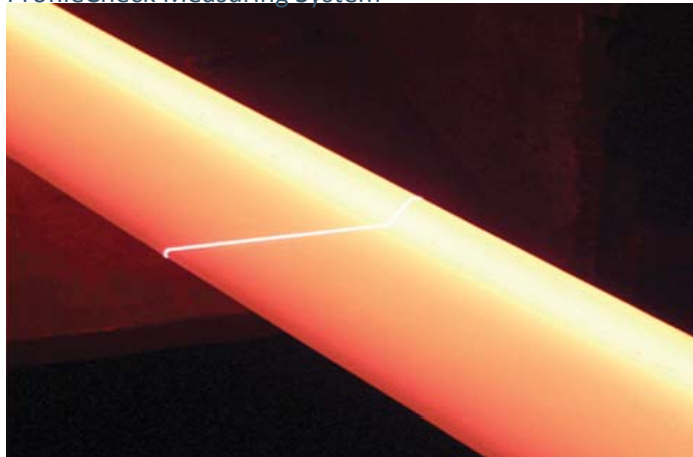
Steel & Industrial

MEASURING AND INSPECTION SYSTEMS

Steel measuring systems

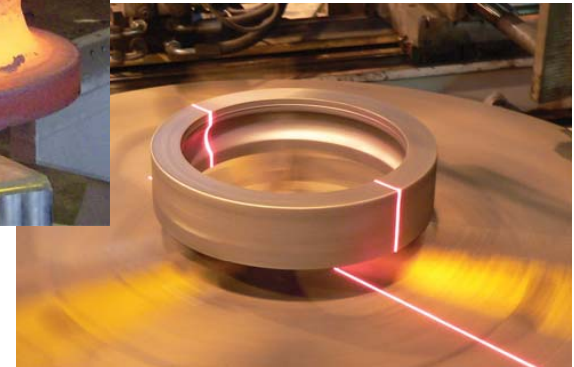
Hot Rolled Long Products

ProfileCheck Measuring System



Seamless Rolled Rings

RingCheck Measuring and Quality Stations



Monoblock Wheels

WheelCheck Measuring System



Open Die Forgings

3D Portal - Automatic laser dimensional measurement during forging



Industrial applications

SPECTRA

The novel high-flow cameras at the forefront of the image and vision computing



Temporal progression of one view



Multiview instantaneous acquisition



PRECISION MECHANICS



SHIP BUILDING INDUSTRY



PRODUCTS AND SERVICES FOR KEYS DUPLICATION



ELECTRONICS



MEDICAL APPLIANCES



MANUFACTURE OF GLASS



MANUFACTURE OF PLASTICS PRODUCTS

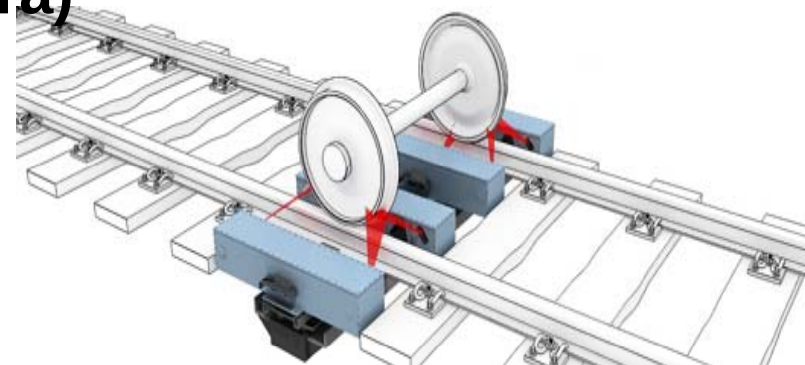


PHARMACEUTICAL INDUSTRY

**Condition Monitoring of Rolling Stock
Diagnostic Systems Business Unit
Gianluca Saccon (PLM)**

WHEEL PROFILE & DIAMETER Monitoring System (Laser Triangulation + Matrix camera)

Features	Detail
Measuring Speed – Low speed system	0 - 20 km/h
Measuring Speed – High speed system	0 - 120 km/h



Measured Parameters

Wheel profile wear

Wheel diameter

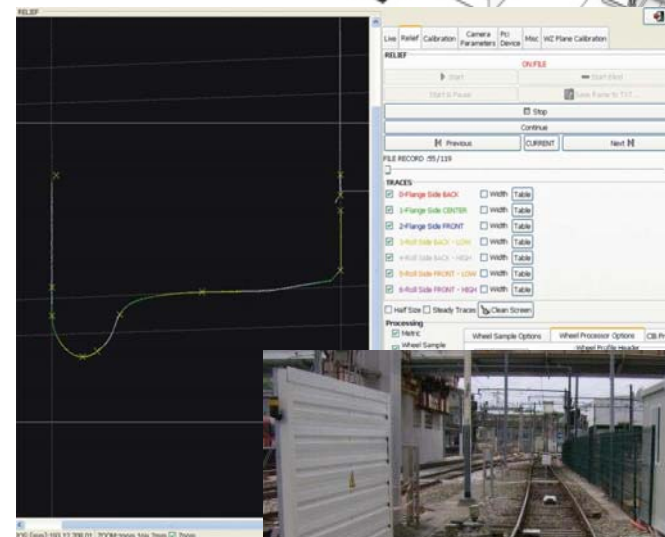
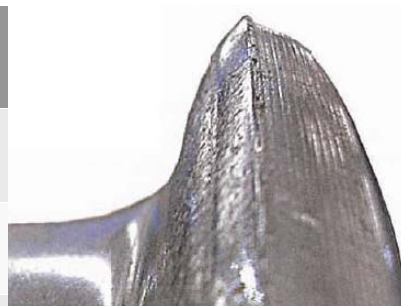
Back to back gauge

Qr (flange angle)

Flange height

Flange thickness

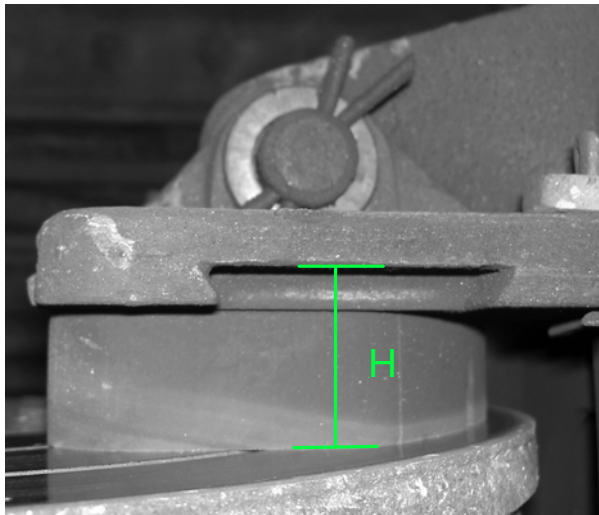
Hollow tread



BRAKE PAD WEAR Measuring System (Vision + matrix camera)



- The detection of brake pad wear is performed by optical digital image acquisition
- Configuration is dependent on brake typology

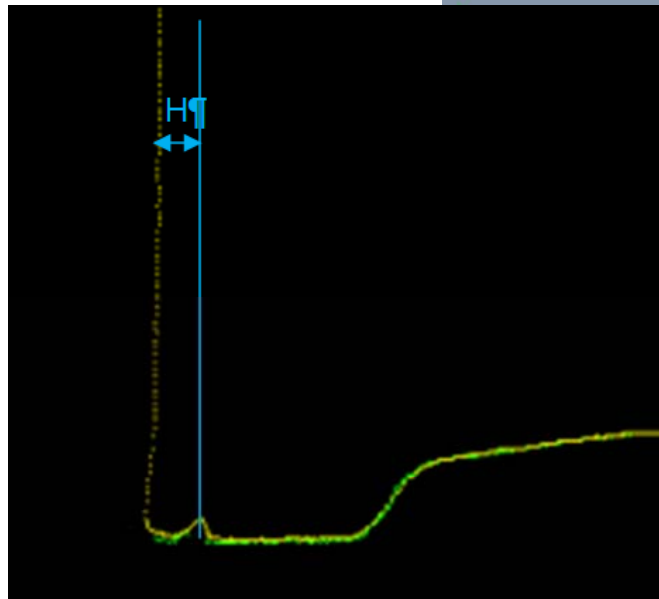
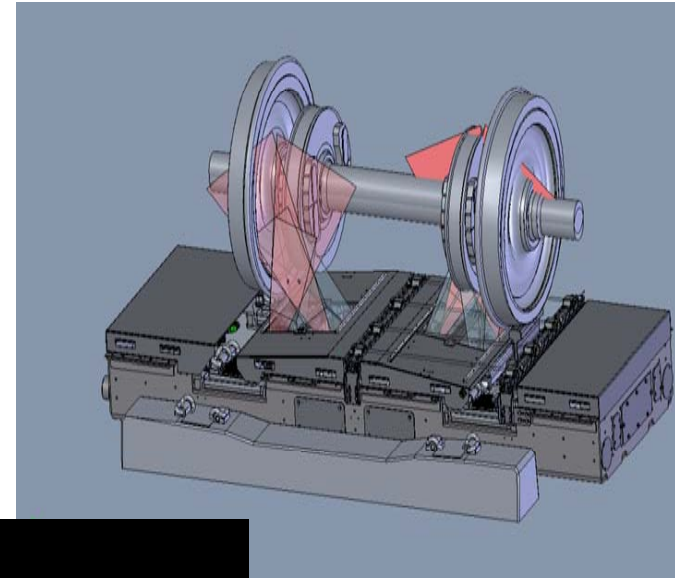


Wheel Mounted Brake disc

BRAKE DISK WEAR Monitoring System (Laser Triangulation + Matrix camera)

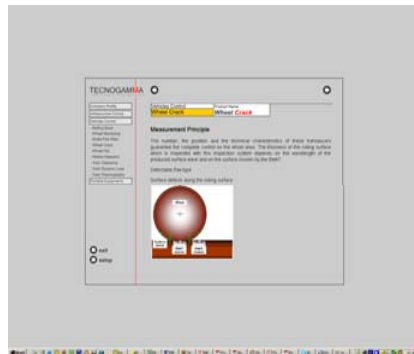
Features	Detail
Maximum measuring speed	20 km/h
Environmental Temperatures	-35°C to 70°C
Environmental Operating Conditions	Day or night, snow or rain

- The detection of disk wear is performed by optical triangulation with a laser and a matrix camera
- Configuration is dependent on brake typology:
 - Disk on Axle
 - Disk on Wheel



TREAD CRACK DETECTION (Ultrasound)

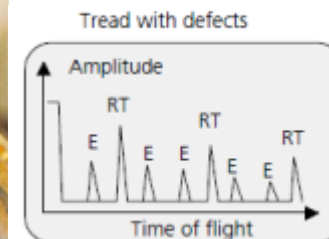
Features	Detail
Measuring speed	20 km/h
Environmental Temperatures	-35°C to 70°C
Environmental Operating Conditions	Day or night, snow or rain



- The no contact ultrasound system is based on **electromagnetic acoustic transducers** which send Rayleigh waves through the wheel
- The processing software analyses the surface waves which are propagated through the surface, highlighting defects in the wheel
- The number, position and technical characteristics of these transducers guarantee the complete control of the whole area



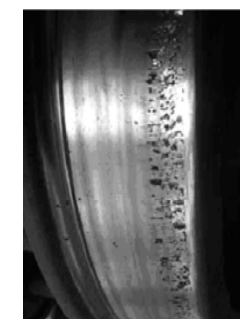
Marubeni installation (Taiwan)



WHEEL SURFACE DEFECTS Monitoring (Vision + Line scan cameras)

Features	Detail
Measuring speed	30 km/h
Environmental Temperatures	-35°C to 70°C
Environmental Operating Conditions	Day or night, snow or rain
Defects visualization	Graphical and images

- ▣ The contactless optical system uses 8 line cameras
- ▣ Max measuring speed of 30 Km/h and no limit for max running speed on the system site. Two running way inspection
- ▣ Surface defect automatic position identification

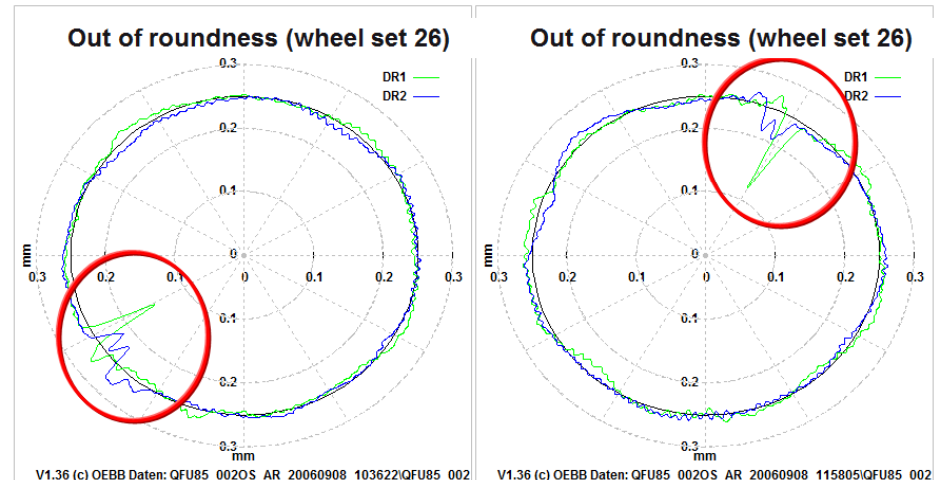


Weight In Motion (WIM) and Wheel Impact Load Detector (WILD)

Features	Details
Transit Speed	5 - 300 km/h
Accuracy Class(Pesatura)	1% fino a 100Km/h; 2% sopra i 100 Km/h
Environmental Temperatures	-30°C ÷ 75°C
Environmental Operating Conditions	Day or night, snow or rain



- The vertical load is measured using strain gauges glued to the rails in several positions along a piece of track (about 10m). It is measured by the elastic deformation of the rail during the passage of the train
- Additional strain gauges can be used to include the lateral load for detecting the L/V ratio and the hunting of the bogie.
- The use of special accelerometers combined with the strain gauges permits to detect and if possible measure: flat spots, polygonization, contamination, eccentricity



Thermographic Control and Trainset Clearance (Laser Triangulation and Mermec Infrared Detector)

The measurement of trainset clearance profile detects exceeding size respect to track maximum allowed clearance.

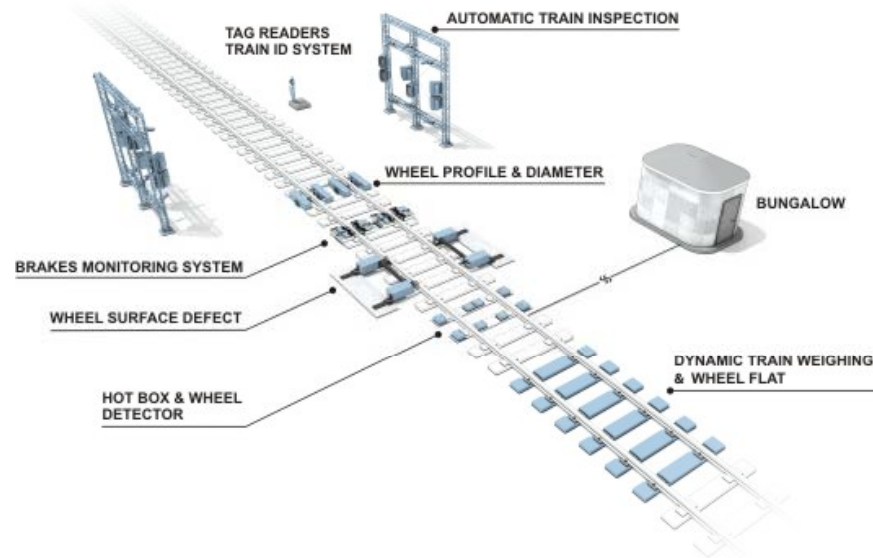
The thermographic control of the surface temperature of all parts of the train detects:

- ▣ Overheating or beginning fire on coaches, cargo carriages and locomotives
- ▣ Brakes and axle boxes overheating
- ▣ Pantograph overheating



Multifunction Train Inspection Gate

The Multifunction Train Inspection Gate is an in-line installation of complementary systems and a fleet data management database which provides railway operators with a comprehensive and meaningful evaluation of the performance of passenger coaches, freight wagons, composite train sets and of the overall traffic.



The Gate integrates the most advanced measurement technologies, both the MERMEC Group's and qualified third-party suppliers systems, in order to support the overall monitoring needs of rolling stock operators.

Every system's architecture is pronouncedly modular, making the Multifunction Gate extremely configurable to the user's requirements.

Thanks for your attention

- Contact sandro.maluta@mermecgroup.com
- For more information please visit our website www.mermecgroup.com
- **Headquarter – ITALY**
via Oberdan, 70 - 70043 Monopoli (BA)
- **Phone:** +39 080 9171 **Fax:** +39 080 9171 112
E-mail: mermec@mermecgroup.com

