



GENPORT SRL WILL EXHIBIT FOR THE FIRST TIME AT 16TH GROUP EXHIBIT HYDROGEN + FUEL CELLS AT HANNOVER MESSE 2010, HALL 27 BOOTH L52 ON APRIL 19-23 IN HANNOVER, GERMANY.



OVERVIEW OF GENPORT SRL SPINOFF OF POLITECNICO DI MILANO



GENPORT is the Italian progressive spin-off of Politecnico di Milano,, developer and manufacturer of an advanced, lightweight technologies for portable *generation in medical, defense, emergency, telecommunication, industrial applications.*

GENPORT combines **Proton Exchange Membrane Fuel Cell (PEMFC)** and **Ion Lithium technologies**, to provide advance power solution to any off-grid external equipment up to 1000 Watt, with superior performance, reliability, and satisfy such requirements as long life, design

flexibility, high energy density, compact configuration, high cycling, high rate discharge, reducing to zero both noise and emissions and operating in extreme environmental conditions

GENPORT brings the strong expertise and mutual beneficial partnerships of a value chain which includes companies, academic and financial institutions; our corporate partners are: Politecnico di Milano, Elemaster, SAATGroup, Credito Valtellinese.

HEADQUARTER, MANUFACTURING, SALES, SERVICES

Via Garcia Lorca, 29
23871 Lomagna (LC) Italy
Ph.: +39 039 22 64 588 – fax: +39 039 999 1289 – email: info@genport.it

RESEARCH AND DEVELOPMENT

Lab _Fuel Cell Assembling and Mechanical Test

c/o Politecnico di Milano Dipartimento di Elettrotecnica

P.zza L. Da Vinci, 32 Milano

Ph.: +39 02 2399.6535 – 6539

Lab Hydrogen and Fuel Cell Test

c/o Politecnico di Milano Dipartimento di Chimica, Materiali e Ingegneria Chimica "Giulio Natta"

P.zza L. Da Vinci, 32 Milano

Ph.: +39 02 2399.3334









HISTORY

GENPORT research team has long-term experience in the fuel cell technologies.

A strong international scientific activity is resulted in more than 100 scientific publications and 8 patents; 15 years in international and national programs focused on breakthrough technologies and methodologies for improving durability, performance and future mass production of portable fuel cells generators brings Genport be a leading designer, developer and manufacturer of advanced, lightweight technology for portable *high energy density electric generation in medical, defence, emergency, telecommunication, industrial applications.*



Mailstone of Genport Project

-  Ceramic materials technologies for Solid Oxide Fuel Cells (SOFC).
 -  YSZ and alumina-based composites
 -  Simulation and prediction of behaviour of ionic conductors
 -  Synthesis of Sr,Mg-doped lanthanum gallates
 -  Composite materials for cathodes (LSGM – LSM)
 -  Polymeric materials technologies for Proton Exchange Fuel Cells (PEMFC).
 -  Characterization and modeling of materials for Polymer Fuel Cells (PEM)
 -  Synthesis and electrical, physico-chemical characterization of Polymeric Membranes
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- + Production of first prototype of gas-diffusion-layers carbon cloth.
 - + Innovative plasma based surface engineering for GDL (Patent: PCT/IT2005/200297).
 - + Development of Catalyst Coated Membrane and Micro Porous Layer.
 - + Development of Gas Diffusion Medium and Gas Diffusion Electrode.
 - + Integration of 5-MEA proprietary configuration into 500 W stacks series.
 - + Development of 500 W stack based on innovative and owned MEA technology.
 - + Foundation of GENPORT srl.
 - + Market release of GENPORT 25 W.
 - + **Release of GENPORT 300 – Hybrid fuel cells at HANNOVER MESSE 2010**
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MARKETS

DEFENCE

A modern Army will benefit from cutting-edge technology which enables soldiers to carry fewer batteries, simplify the logistics and provide a limited but reliable and constant power source. Military-wearable instruments rely on several different types of secondary batteries. Traditional generators cause both a logistical problem and a serious danger, as associated noise, heat signature and emissions can be

detected by the enemy.

GENPORT can be utilized as battery charger as well as an integrated internal power source for portable terminal communication systems, reducing to zero the heat signature, noise and providing a constant, reliable source of power available for extended periods of time.

EMERGENCY

There are situations in which you cannot wait for a replacement of a power source, in which human life may depend on the capability to continuously communicate. Cell phones, two-way radios, charged and ready, are one of most vital tasks during any disaster. Navigation systems, SA computers have to constantly assist rescue operators in remote locations. **GENPORT** can be utilized as battery charger. With small tanks of fuel and the **GENPORT** system, police operators, search and rescue teams in the Alps as well as in the desert, can continue to operate with vital equipment safely powered.

TELECOMMUNICATION

Remote telecommunications systems displaced in off-grid locations, such as islands or deserts, where temperature variations are relevant, coping with reduced maintenance, pile pressure on network operators to perform without fail. Off-grid installations, as well as longer UPS back-up periods, stretch the ability of current technology to cost-effectively deliver reliable performance. A conventional power solution is a noisy, bulky and high-emission diesel generator. Remote mobile telecommunications, temporary telephone booths, and remote portable telecommunications units can all benefit from the fuel cell where a longer autonomy time of the power source can be essential.

GENPORT utilized as a battery charger or internal power source can provide a reliable and long-term energy system integrated with a stand alone renewable energy unit.



INDUSTRIAL AUTOMATION

The energy demand for a lightweight power source in industrial equipment has been gradually increasing over the past several years. There are several categories of industrial applications that all require higher energy density sources. Industrial robots, motion control units, field instruments and control-system devices are some of possible applications that can benefit from longer runtime, lighter weight power sources enabled by **GENPORT** technology.

ELECTROMEDICAL

The energy demand for portable medical equipment has increased significantly, driven by the need for efficient decentralized care centers. For example, immediate medical assistance at disaster sites and car accident must be supported by reliable lightweight power sources. There are a wide range of devices such as defibrillators, X-ray diagnostic units, portable electrocardiograph and ultrasound, remote medical diagnostic devices, wheel-chairs, which have to operate close to patients' point of treatment even in extreme environmental conditions and for a long time. **GENPORT** utilized as a battery charger or internal power source in medical devices, provides constant, reliable, long term power as a stand-alone generator, as well as integrated as an internal power unit.

NAUTICAL

Sailing is a great and exhilarating experience, but direct contact with the nature can be compromised by unreliable, short-term and noisy diesel and secondary battery power sources. In recent times there has been an increased call for mounted devices on board, requesting additional power sources. A unique adventure may be even more compromised by an inadequate power source; experience of smell and noise for a long voyage affects the entire spirit of the adventure and eventually the limited residual capacity of the battery obliges one to limit a sailing plan. **GENPORT** provides the required energy, in a compact, smooth, vibration-free generator. **GENPORT** can be utilized as an auxiliary power unit to feed all the internal devices, providing a constant, reliable, long term, silent power as a stand-alone generator using methanol, as well as integrated with existing renewable energy systems.

GENPORT 300 HYBRID FUEL CELL



is an innovative portable fuel cell system designed to maximize power density, reduce to zero noise, thermal signature, pollution, vibration and provide a constant, reliable source of power.

GENPORT, is based on PEMFC technology, designed as a flexible fuel cell unit, for any application where a lightweight, high energy density off-the-grid generator feature is required.

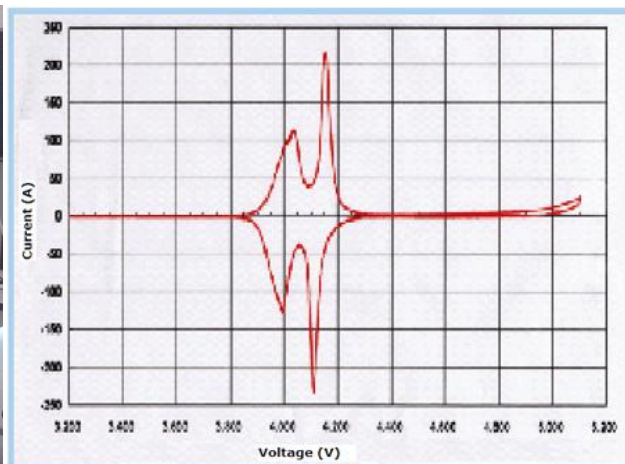
GENPORT, is a very versatile device, which can operate as Battery Charger (BC), Auxiliary Power Units (APU). Different fuels system can feed **GENPORT**, such as compressed hydrogen, metal hydrides, chemical hydrides, supplied in cartridges, or, to solve definitely logistic problems for the delivery of the fuel, **GENPORT**, can be integrated into an off-grid renewable energy system.



MAIN FEATURES

- ✚ Hybrid PEMFC Power Generator (Battery & PEMFC)
- ✚ 300 Watts Power Output for most electro-medical equipment, Small telecoms, auxiliary power unit of yacht, laptop computers, radios, and satellite phones, remote meteo stations, emergency equipments, houses.
- ✚ Voltage: 24 Vdc, 12 Vdc, 230 Vac
- ✚ Weight: 15-25 kg
- ✚ Operating temperature: 5° C to + 40°
- ✚ Noise: < 60 dB(A) @ 1 meter distance
- ✚ Fuel: Compressed H₂, Metal Hydride, Solid Hydrogen Cartridges (1500 Whr / 5 Hours)
- ✚ 19" rack suitable for OEM, wearable, rugged aluminum case.

ION LITHIUM BATTERY PACKS



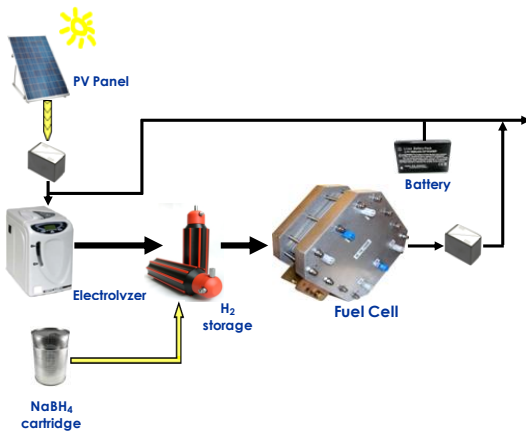
GENPORT has an equipped electrochemical laboratory to engineer Battery Management Systems (BMS) for rechargeable batteries, carry on Polarization Test, Impedance Spectroscopy Analysis, Battery Cycling Tests.

- ✚ Battery Cycling Test, Stress Test and life analysis, to select the appropriate cells
 - ✚ Design of packs with minimum weight and volume
 - ✚ Engineering directly into the host equipment
 - ✚ Different cell configurations as well as a range of connectors
 - ✚ Pack using cells extensively tested in a range of harsh environments
 - ✚ Power source rely on a Smart Battery Interface allowing communication via SMBs
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A PROJECT SUPPORTED BY THE EUROPEAN UNION

Genport is the project coordinator of **MARIPEM**, an Eurostars project earmarked for funding by the Relevant national funding agencies. The aim of the project is to demonstrate the capability of a lightweight portable fuel cell generator to provide a constant, reliable source of power when operating in marine environmental conditions. The project consortium embodies the following partners: the Institute Of Mechanical Engineering and Industrial Management (Portugal), Instituto Nacional de Engenharia, Tecnologia e Inovação (Portugal), Soluções Racionais de Energia, SA (Portugal), Politecnico di Milano - Department of Chemistry, Materials and Chemical Engineering "G.Natta".



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