modular approach to automation. MTP describes the module interfaces and functions needed for process control and for the digital integration of encapsulated equipment modules in higher-level control systems. A controller and the basic automation functionality of a modular equipment can be easily integrated into a heterogenous, vendor-independent system environment.

Within the automation engineering, the basic automation of a module can be implemented as a black box but offering service-oriented interfaces to higher-level control systems. The higher-level control systems orchestrate the modular plant units by coordinating and invoking the services provided by each module. Overall, the MTP concept paves the way of future-oriented open and flexible service-based system architectures for process control.

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For further reading

https://simpli-demo.eu/

About the author

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The LEANFA company

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LEANFA is an Italian company founded in 2014, specialized in design and manufacturing of solid-state microwave and radiofrequency amplifiers and generators, that has recently joined the renowned MUEGGE Group. LEANFA's technology has already been widely validated by several universities and research centres worldwide, and its OEM microwave generators have progressively been adopted by demanding customers involved with projects in the industrial, scientific and medical fields. LEANFA's strong point is essentially its ability to work with a small and efficient team and to count on the great skills flexibility of its young engineering team.

LEANFA's work is constantly focused on grabbing the best of the great advantages of the innovative solid-state microwave technology, especially by means of suitable software platforms that are co-designed with the microwave generators, opening the doors to a virtually infinite series of easily customizable applications which are at the same time very user-friendly and allowing processing accuracies so far unimaginable.

LEANFA's OEM generators are compact, lightweight and highly reliable, perfect to be quickly integrated in equipment for applications in many ISM fields (e.g., solid-state cooking, microwave chemistry, plasma generation, organic tissue ablation, automotive ignition and many others), fully

based on steady solid-state technology with high power efficiency and total parametric control. All the modules are powered by low-voltage DC supply, tested for CW and pulsed power modes and enclosed in shielded metal cases, ready for forced-air or liquid cooling with minimum assembling effort.

LEANFA also offers user-friendly evaluation kits for a quick *plug&play* assessment of the new solid-state technology and compact benchtop generators for a trouble-free laboratory use, perfect for universities and research centres that need flexible and reliable tools for their experimentation programs.

The most recent and valuable developments are mainly focused on the medical world, where LEANFA has recently completed the development of complete medical-grade equipment based on radiofrequency, microwaves and laser technologies, combining high-quality hardware construction with sophisticated software design, in line with the relevant international standards.

About the author

Marco Fiore received his M. Sc. degree in electronics engineering at Politecnico di Bari, Italy. He has worked for more than 15 years in the field of digital telecommunications and broadcasting, from design tasks to operational management, always dedicated to implement deep interaction between high-frequency power electronics and programmable digital devices. He is co-founder of LEANFA in 2014, fully devoted to foster new business opportunities in Industrial, Scientific and Medical fields by means of innovative solid-state generators powered by distributed software applications.

The Muegge Group

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The MUEGGE Group is a leading manufacturer and supplier of function-critical industrial microwave components, systems and plasma sources with a strong global presence.

Founded in 1979 and headquartered in Reichelsheim, Germany, the MUEGGE Group employs approximately 170 people and provides solutions for a wide range of industrial applications, such as growth of lab-grown diamonds, processing of food and semiconductor components, drying processes, molecular extraction in chemistry, and hydrogen production for customers in more than 40 countries.

To serve our global customer base close to their requirements, we rely on a network of partners and operate successfully in the American market with our subsidiary MUEGGE Gerling (formerly GERLING APPLIED ENGINEERING, INC). At present, about 25 employees work at the location in California including a production facility for customized magnetrons, isolators and waveguides. Our customers can also rely on a network of competent, specialized partners in Asia.

As a strong employer in our region, it is important for us to show responsibility for the environment. To reduce our CO_2 footprint, we installed a photovoltaic system on all three building roofs in 2022, with a total output of 200 kWp. MUEGGE is a founding member of the "Unternehmensnetzwerk Klimaschutz - Eine IHK-Plattform" (Network - Corporate Network Climate Protection (klima-plattform.de)) and a participant in the UN Global Compact in Germany (MUEGGE GmbH | UN Global Compact).

Thanks to its advanced and sustainable technologies, MUEGGE is a sought-after partner in a wide range of industries and is already contributing to solutions for future topics such as