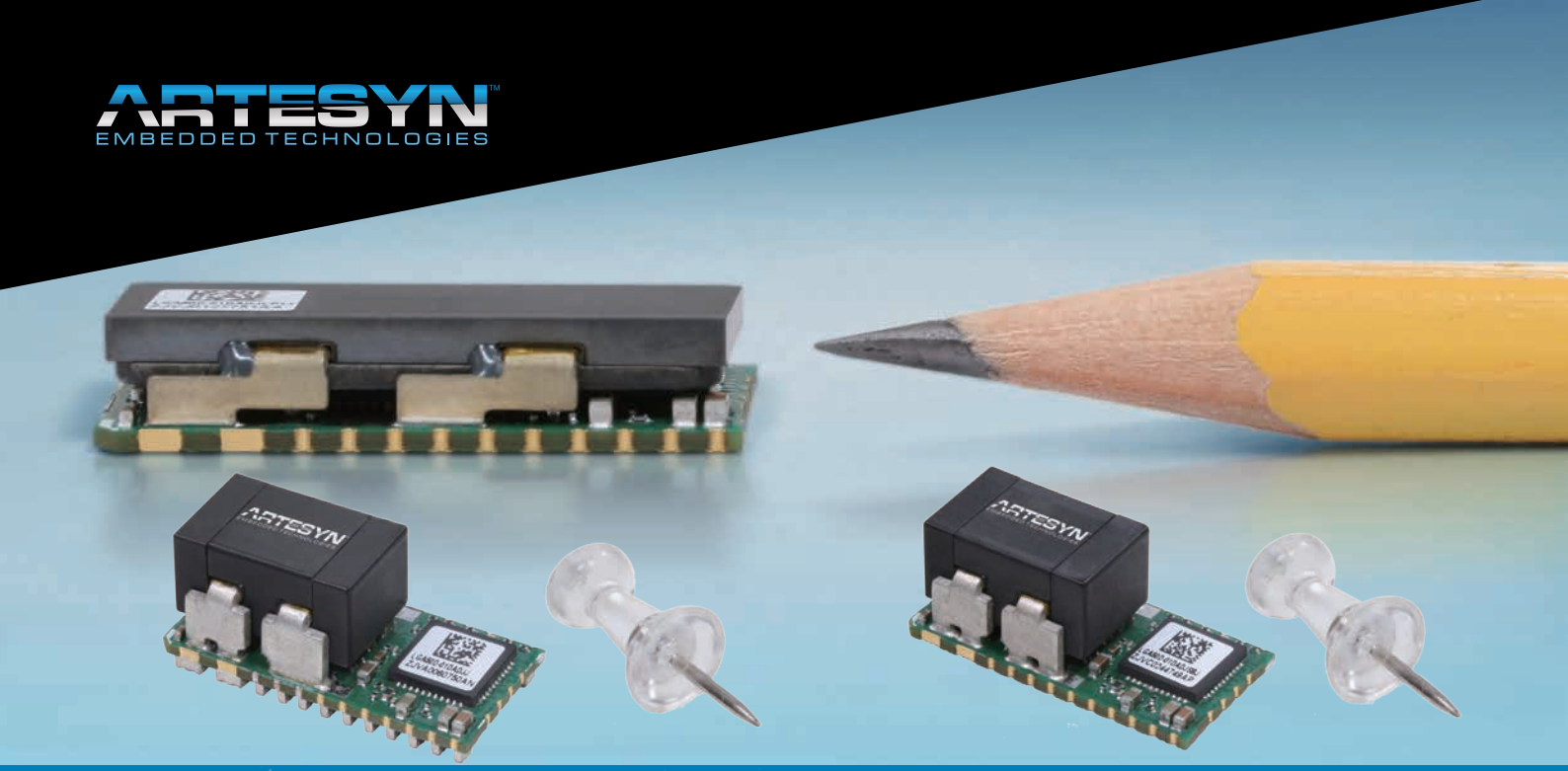
ARTESYN
EMBEDDED TECHNOLOGIES



Server Processors | FPGAs | Supercomputers | Telecom, Networking, Datacenter | Graphics & Video Processors

LGA50-D Digital DC-DC Converter Module

DIGITAL DC DC

The LGA50-D family of modules from Artesyn Embedded Technologies is an extension of the LGA family of DC-DC converter modules which were the first of their kind on the market. This innovative non-isolated unit offers two independent and configurable 25 amp, 50 watt outputs, which can also be combined to a single configurable 50 amp, 100 watt output.

The LGA50D modules share their footprint with the higher rated member of the digital POL family – the LGA80D. They both have a footprint of 1 x 0.5 inches or 25.4 x 12.5mm. However, the LGA50D is available with different mechanical mounting options. There is a version of the product that shares exactly the same terminations as the LGA80D, whereas the other 2 versions offer either an LGA-termination type or an exceptionally low profile version of just 5.5mm in height.

As with Artesyn's other LGA products, you can also generate higher current rated rails by connecting up to 4 units in parallel. In this case up to 200 amps can be supplied as a single power rail. The unit's efficiency is also market-leading, with 95.5% typical, one of the highest available in this product category.
Both analog control and digital control functions are enabled on this unit, so the LGA50-D can be controlled with a resistor or controlled and monitored by using the industry-standard PMBus digital interface.

Applications such as graphics, data or video processing, using high power devices, such as server processors, FPGAs, supercomputers, network, storage and telecom equipment, can benefit from the current density, efficiency and flexibility of control of Artesyn's LGA50-D digital DC-DC converter.

100 W Max Power	Input 7 – 14 Vdc	Output 0.6 – 5.2 Vdc	Two 25A or a single 50 A output	Digital or analog control

The demands on Non-Isolated POL Converters

As the circuit boards in telecom and data center systems have become more complex and densely populated, every component is under pressure to provide maximum value with the additional target of reducing the physical size. The key is to increase the amps per square inch current density of non-isolated converters with the objective of freeing up space that can be used to increase the computing power of a board by reducing the amount of real estate used for power conversion. This is now also true of the total volume of the power-conversion stages, and so module height is also under pressure to be reduced. The low-profile version of the LGA50D addresses this and has one of the highest power densities in terms of Amps per cubic inch on the market for this type of power converter. LGA50D has also been designed with cost in mind to address this key factor in decision making of a power conversion solution.

Technical Details

The Artesyn LGA50-D is designed with a voltage mode dual-phase synchronous buck topology. It can accommodate a wide range of ambient temperatures thanks to extremely high power conversion efficiency and resultant low power dissipation, combined with the excellent thermal management design of the unit.

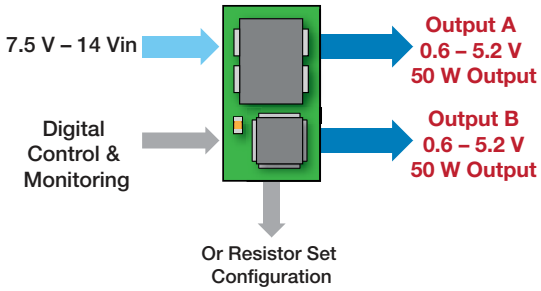
Each module offers two independent and configurable 25 amp, 50 watt outputs, which can also be combined to a single configurable 50 amp, 100 watt output. You can generate higher current rated rails by connecting up to 4 units in parallel so that up to 200 amps can be supplied as a single power rail.

The input voltage and output voltage specifications remain the same in any configuration, so the input is defined as 7.5 V to 14 V. The output voltage for the standard profile versions can be adjusted within the range of 0.6 V to 5.2 Vdc and the output voltage for the low profile version can be adjusted within the range of 0.6 V to 3.3 Vdc meaning that a broad range of semiconductor devices and applications can be supported.

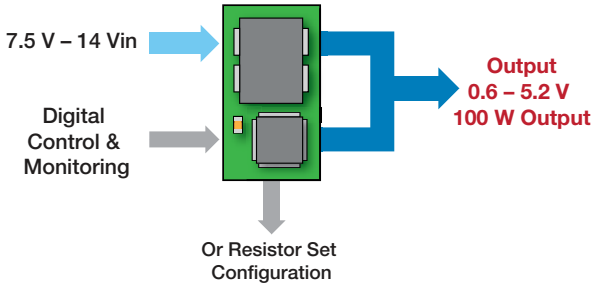
In a dual output configuration, the LGA50-D can be controlled (by either PMBus or external-resistor control) to supply up to 50 W per channel. In single output configuration, each module can support 100 W, and this is the power rating of the blocks that can be stacked together, so you can achieve 100 W with a single unit, 200 W with two units, 300 W with three units or 400 W with four units.

The maximum output power that the module delivers will depend on a number of parameters, primarily the output voltage setting and ambient air temperature and velocity (forced airflow or natural convection). The LGA50-D module has an operating temperature range of -20 °C to 85 °C with an almost entirely flat derating curve depending on the variant chosen.

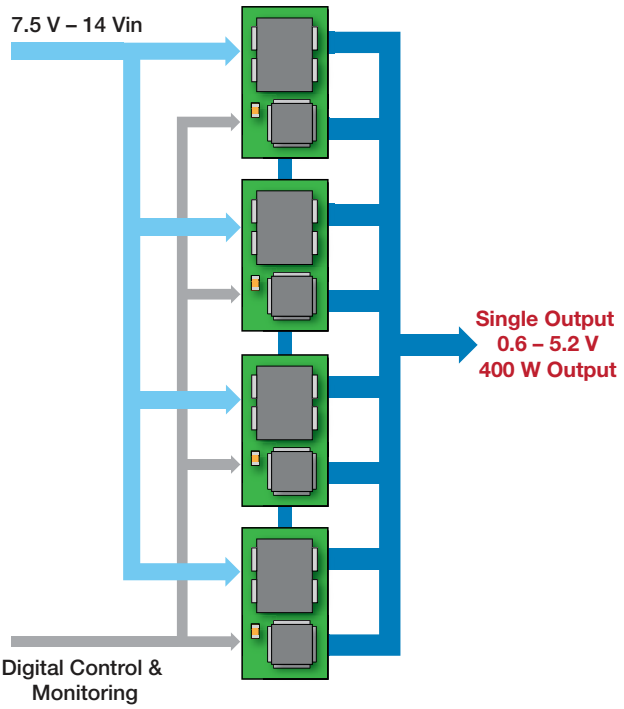
Single Unit
Dual Output Configuration

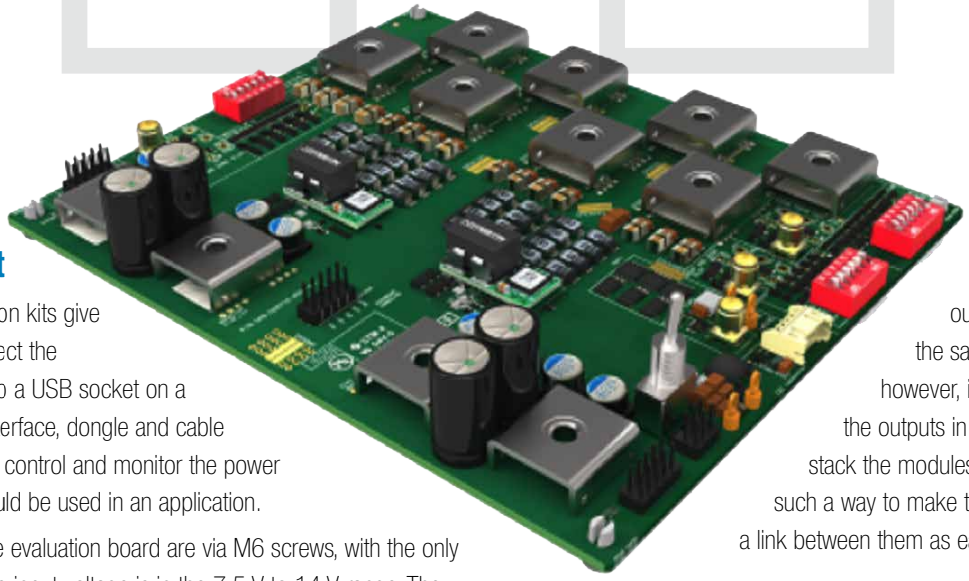


Single Unit
Single Output Configuration



Up to 4 Stacked Units in
Single Output Configuration





Evaluation Kit

Artesyn's LGA evaluation kits give you the ability to connect the demonstration board to a USB socket on a PC, with the PMbus interface, dongle and cable provided in the kit and control and monitor the power converters as they would be used in an application.

The connections to the evaluation board are via M6 screws, with the only provision being that the input voltage is in the 7.5 V to 14 V range. The output connections use the same M6 screws, however, if you want to connect the outputs in parallel or you wish to stack the modules, they are placed in such a way to make the operation of placing a link between them as easy as possible.

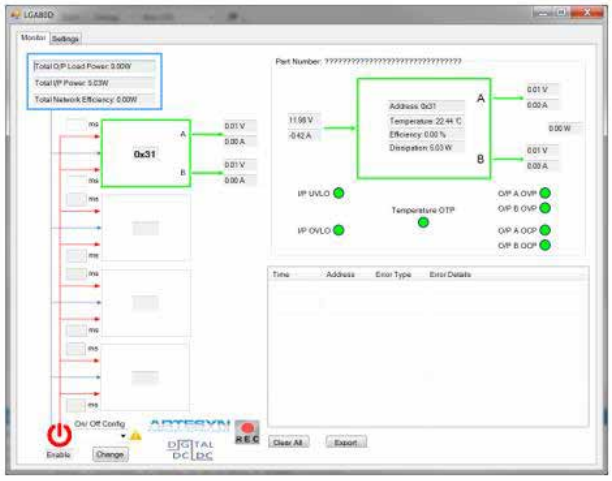
Module Management GUI Software

The increasing functionality and performance of devices such as FPGAs has driven a need for more advanced power management functions. Digital conversion techniques implemented in Artesyn's LGA80-D and LGA50-D families of non-isolated modules offer an answer.

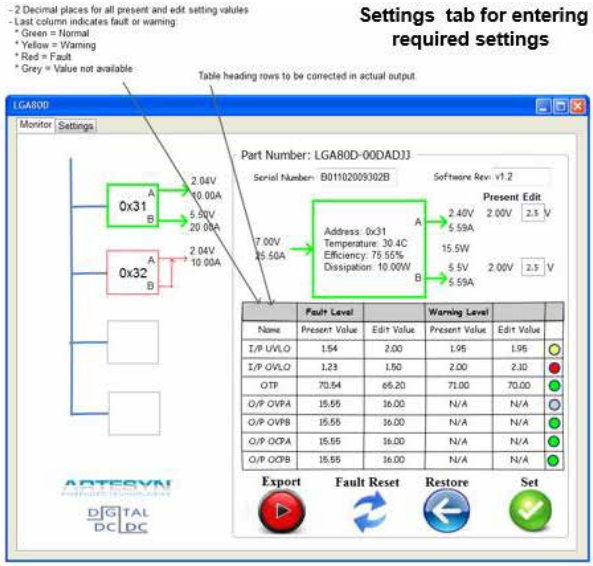
Digital and analog converters have much in common, such as similar power switching devices and magnetic structures (inductors and transformers), however, the inner control loop provides digital flexibility for tailoring power delivery to the application and enabling the power systems to dynamically adapt to changes in operating conditions in real time. Communications, monitoring and control are implemented over the industry-standard PMBus.

For simple evaluation, configuration and monitoring, Artesyn offers a PC-based graphical software package for all LGA class units in conjunction with respective evaluation kits. Two intuitive tabs allow you to enter the required settings for individual converters and monitor the status and parameters. The demonstration board is fitted with two LGA class modules allowing you to test independent channel, or stacked-module operation.

Monitor tab for reading status and parameters



Settings tab for entering required settings



About Artesyn Embedded Technologies

Artesyn Embedded Technologies is a global leader in the design and manufacture of highly reliable power conversion solutions for a wide range of industries including communications, computing, consumer electronics, medical, aerospace and industrial automation.

Artesyn is one of the world's largest and most successful power supply companies, embracing the well-known Astec brand. The company's extensive standard AC-DC product portfolio covers a power range of 3 watts to 24 kilowatts and includes open-frame and enclosed models, highly configurable modular power supplies, rack-mounting bulk front end units, DIN rail power supplies, external power adapters and power supplies for LED lighting. Many of these products are available in medically approved versions and many of the higher power models feature extensive built-in intelligence.

As an industry leader in distributed power applications, Artesyn produces an exceptionally wide range of DC-DC power conversion products. These include isolated DC-DC converters, covering industry-standard sixteenth- to full-brick form factors with power ratings from 3 watts to 800 watts. Artesyn also offers three application-optimized families of non-isolated DC-DC converters, non-isolated memory power, and processor voltage regulator modules (VRMs).

As a pioneer in low power switch mode adapters, Artesyn has designed and manufactured solutions for almost every major mobile phone supplier. With well over one billion chargers shipped from its best-cost facilities, Artesyn has aligned itself to meet the demands for the next billion chargers through new platforms, automated manufacturing methodology and unsurpassed quality and reliability.

For more than 40 years, customers have trusted Artesyn to help them accelerate time-to-market and shift development efforts to the deployment of new, value-add features and services.

Headquartered in Tempe, Arizona, Artesyn has over 15,000 employees worldwide across multiple engineering centers of excellence, four wholly-owned world-class manufacturing facilities, and global sales and support offices.

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