

High-tech components and innovation result in efficient, compact power supplies for automation applications



Automation engineers are looking to equipment makers for a new generation of smaller, efficient and rugged DIN rail power supplies. Source: Altech

Automation is the key factor driving enhanced manufacturing productivity. Machines and robots that do not tire, get sick or need vacations will be used in rapidly escalating numbers. But many industrial operations demand humans and robots work together. Often a work cell might comprise humans carrying out highly skilled operations while the small-scale assembly robots complete repetitive tasks thousands of times without error.

These small-scale robots are complex amalgams of mechanical, electronic and firmware components and cost tens of thousands of dollars; yet without a reliable and clean power supply — the lifeblood of automation — these assets would just be expensive dust-collectors.

The control and power supply equipment for small-scale robots are housed in cabinets designed to secure and protect the fragile units. The cabinets are equipped with DIN rails to make it easy and convenient to mount and wire-up kit. But because factory space is at a premium, the cabinets are packed tightly. Moreover, expensive forced ventilation is used sparingly, so cabinet temperatures can get high, and the factory environment is often contaminated and humid.

Faced with these challenges, automation engineers are looking to equipment makers for a new generation of smaller, efficient and rugged DIN rail power supplies. Those engineers also demand power supplies that are readily available, easy-to-install and perform reliably for many years. And because many companies have manufacturing location in multiple countries, it is also important to customers that a single product range is capable of — and is certified for — operation across the globe.

Price is also a prime consideration as automation engineers look to bring their projects in on budget. This does not mean they are looking for the lowest purchase price, rather the best “cost-of-ownership” solution where widespread availability and purchase, operation, maintenance and disposal expenses all come into play. Last, and very much not least, customers are influenced by a supplier’s commitment to sustainability; questions such as “Is the power supply built to make recycling easy at the end of its life?” are among the first that engineers ask.

The importance of power density

Today’s customer demands are very different from those at the turn of the century. Back then, bigger was considered better for power supplies because larger units were perceived to be capable of handling more power while being more robust. But those units were inefficient, bulky and heavy. And wholly unsuitable for mounting in DIN rail cabinets.

The design constraints introduced by the cabinets encourage a drive for enhanced power density (W/cm^3), which in turn spurred innovation in electronic power components and power supply topologies. A new generation of switch mode power supplies, using high-frequency electronics to dramatically boost efficiency, has seen power density rapidly climb together with efficiency. These advances have been made possible by a new generation of power components — such as power transistors, inductors and transformers — which supported increases in power density while improving voltage regulation, reducing electromagnetic interference (EMI) and boosting reliability. Such is the pace of advance over the last decade-and-a-half that leading-edge products supplying 480 W now fit the space formerly occupied by 120 W power supplies.

Altech, a Flemington, New Jersey, DIN rail power supply maker with decades of experience, is at the forefront of the DIN rail power supply revolution. Over the last 20 years, the company has leveraged its extensive engineering experience to extend the power supply design envelope and maximize the advantages offered by the latest component technology. As a result, the company has established itself as a global leader in the design and manufacture of power supplies at the leading edge of power density.

While the company has taken advantage of state-of-the-art power components, its products also benefit from the expertise and resources required to perform the multiple design iterations needed to ensure the product is optimized for the target applications. These include not only factory automation but also smart home automation, communications and LED signage. And while many power supply companies target just the highest-selling sector of the total market, Altech is one of very few global concerns that have a wide range of power supplies suitable for hundreds of different applications.

Renowned for its customer service, Altech can assist automation engineers at any stage of their installation or maintenance project. For example, the company has in-house engineering staff who can advise customers on any aspect of project design, installation and configuration. Once those questions have been resolved, Altech promises a readily available

supply of products from its New Jersey, U.S. warehouse. Its DIN rail power supplies are pre-certified, drop-in solutions that just need clipping to the cabinet's DIN rail and wiring up.

Highly compact DIN rail power supplies

Building on its reputation and design expertise, Altech has recently introduced a new range of highly compact, efficient switch mode power supplies for automation applications that perfectly meet today's customer requirements. The power supplies leverage the latest technology and components to achieve the maximum power density. And the compact dimensions and DIN rail design makes for simple and fast installation. The 60 W DIN rail power supply, for example, has a height profile that is half that of competitive products (Figure 1). And the new 240 W power supply is just 40% of the width of the previous model (Figure 2).

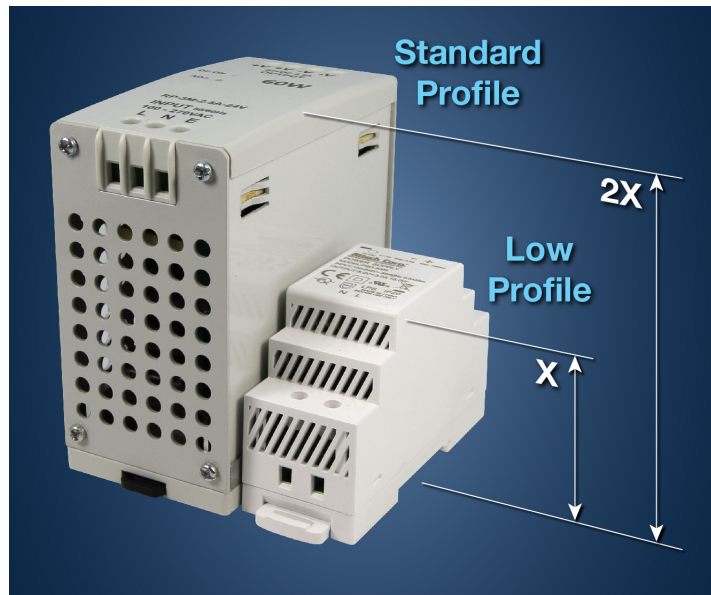


Figure 1. Altech's 60 W DIN rail power supply uses the latest components to maximize power density. The result is a product, which is half the height of competitors' products. Source: Altech

The range of compact power supplies is available in 15, 30, 60 or 100 W versions with 5 to 48 V outputs. A second range of compact power supplies offers 75, 120, 240 or 480 W with 12 to 48 V outputs. Both new ranges operate from 90 to 240 V AC 50/60 Hz inputs. Features of the products include 100% full load burn-in, low-voltage and current ripple, Class II isolation, UL, CE and other certifications, and overload, overvoltage and short-circuit protection. The new power supplies boast efficiencies of more than 90% — for lower power dissipation and enhanced thermal performance — and feature conformally coated PCBs to protect against contamination and humidity.



DIN rail power supplies are popular with engineers because the ease-of-installation and modularity that the system provides brings clear advantages over alternatives for powering industrial automation. This popularity has encouraged hundreds of suppliers to offer power supply solutions suitable for DIN rail mounting.

Figure 1. The company's 240 W DIN rail power supply is just 40% of the width of the previous model. Source: Altech

When choosing the best solution, it is important to consider both the technical attributes of the product and the commercial, customer and technical support offered by the supplier. Engineers should look for high power density to ensure their application's power requirements are provided by the most compact solution, and it is also important to select a high-efficiency product to ease thermal management. Engineers should also look to a supplier that has a good reputation in the market, offers a comprehensive product range and supplies globally certified products.

A manufacturer that can offer design and technical support will help to compress project schedules and simplify installation and configuration, while readily available supplies of all product types will ensure rapid delivery of new and replacement units. Finally, it is important for the engineer to establish the supplier's sustainability credentials. Altech scores highly against all these product-selection criteria. Visit their [website](#) for more information.