

The 80-20 principle

### Series efficiency meets client-specific flexibility



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The electronics industry expects reliability, speed and maximum flexibility from SMT placement machines. PULS Value-Add system solutions focus precisely on these attributes.

Our tailored power supplies combine the advantages of standard and client-specific power supplies.



*Caption 1: For ASM, PULS has combined several standard power supplies, two modified power supplies and a purely client-specific assembly to a highly efficient complete system.*

ASM Assembly Systems has been using PULS standard power supplies for many years. They are impressed with the efficiency, reliability and quality of the power supplies, and their detailed datasheets. However, standard power supplies were not good enough for the new SMT placement machines of the SIPLACE SX series. This is why ASM engineers asked PULS for a purely client-specific power supply in their specifications. Instead of the

expensive and heavy 50Hz transformers, the latest generation had to be equipped with machine-specific switch-mode power supplies to supply their assembly heads with power. This was an important technical development. However, already in the quotation phase, the planned custom solution prove to be little efficient: Both the calculated costs and the design time did not match ASM's project plan.



## VALUE-ADD = FLEXIBLE STANDARD + CLIENT-SPECIFIC MODULES

PULS project managers and designers have been working closely together with ASM engineers from the very beginning – and not just over the telephone but directly in the ASM development department in Munich. Performance measurements could be therefore taken on the placement machine prototypes at an early stage. PULS wanted to find out if this project could also be implemented with a cost-optimised system based on modified standard devices. And indeed, a so-called Value-Add system solution could be offered to ASM, based on the findings and on a precise understanding of realistic load situations.

With Value-Add, PULS offers its customers a platform for flexible power supply solutions, to be used in specific applications where standard DIN-rail power supplies are not sufficient. These complete systems consist of original and modified standard power supplies equipped with application-specific mechanics and cabling. If required by the application, the system can be expanded with client-specific modules by our subsidiary MGV. This solution is based on the 80-20 principle. This means that for the implementation of a Value-Add project, PULS uses about 80% original and modified standard power supplies and only 20% purely client-specific assemblies. The wide range of products, which currently comprises more than 200 DIN-rail power supplies, DC-UPS devices as well as battery, buffer, redundancy and protection modules, serves as an assembly kit.

For instance, a complete optimised solution was designed for the power supply of ASM's SIPLACE SX4 speed module, in order to supply it with dynamic loads. The system consists of a 24V, 20A (DIMENSION QT20.241), a 24V, 40A (DIMENSION QT40.241) and a 36V, 26.7A (DIMENSION QT40.361) standard DIN-rail switch mode power supply, two modified QT40 power supplies (DIMENSION QT40.999-70) and a client-specific, maintenance-free buffer module (PCS417.771) with electrolytic capacitors as an energy source.

SIPLACE SX4 can process up to 135,000 components per hour. To achieve this, the assembly heads must accelerate to extremely high speeds, resulting in peak loads of 30kW. A significant task of the Value-Add system is to cover these load peaks with power generated by the buffer module and thus prevent undesired effects on the power system.

The Value-Add solution has been designed in such way that the assembly heads are powered up by the buffer module. Each modified version of the QT40.241 delivers 1,300W, two output voltages (300V and 162V) and serves for permanently recharging

the electrolytic capacitors in the buffer module. To increase the continuous standard output from 960W to 1300W, the power supply is equipped with a fan that turns on automatically when temperatures are too high. The fan also increases the power supply's lifetime at an ambient temperature of up to 60°C.

A lot of data, such as the electronic identification nameplate, the output voltage, performance, temperature, lifetime and previous runtime, is already recorded by the QT40.241 standard power supply. However, this information can only be read out by PULS – for activities such as

error analysis, etc. ASM also wants to make this data accessible to its customers. A modified communication interface is the solution to this requirement. The power supplies now constantly transmit data to the buffer module, which also

serves as a data storage. This data node allows ASM customers to read out the information provided by the power supply centrally and at any time.

To maintain the width (110mm) of the modified QT40 despite the additional features, the double-sided PC-boards are

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*Caption 2: The client-specific buffer module in the centre of the image serves for supplying additional power during peak loads and is recharged using the modified QT40.241.*

replaced by multi-layer versions and smaller essential elements of the same quality are used.

This application example is based on the Value-Add platform and shows how several standard power supplies, two modified power supplies and a purely client-specific assembly are combined to a highly efficient complete system.

*“In a 24/7 production, each standstill costs money to the company.”*

### Safety as a key argument

New purely client-specific developments always pose a certain risk to users: Is it possible to adhere to the tight schedule? Will the product receive all the required approvals right away? How about the EMC values? Does the power supply harmonise with the machine’s other essential elements? How does the device behave throughout its entire lifetime? In the case of Value-Add solutions, the majority of these questions can be answered quickly thanks to the experience with standard products. This means that in combination with a high series quality, the risk for the users is reduced significantly.

This guaranteed safety and the high quality of the products are crucial aspects, even for ASM. In many major manufacturing plants, SMD placement machines of

various makes are located directly next to each other. This means that the machines can be compared directly, which leads to a tough competition. The manufacturer on whose SMT line the red warning light is lit the longest or most frequently, will find

it difficult to negotiate follow-up orders. Because maintenance means standstill. In a 24/7 production, each standstill costs money to the company.

Reliability, process reliability and a long service lifetime are therefore crucial requirements for SMT lines and their integrated essential elements. This is why ASM wanted to make sure from the very beginning that the power supply is able to ensure system availability at all times, even under extreme conditions. During the Design-In-Phase, PULS engineers adjusted the power supplies directly on the customer’s machine and simulated different loads. Among other things, they programmed extremely power-consuming

assembly processes, which deviate from a realistic, sequential placement. The QT40 prototypes and the buffer module passed this practical load limit test without any problems.

### Profitable for users

The costs and the time required for new purely client-specific developments and their manufacturing are high. One of the reasons is the fact that the work steps required for quality assurance and for the organisation of approvals have become almost as costly and time-intensive as the actual design phase.

However, discussions with numerous customers have shown that in many cases, one doesn’t always need to develop a new product from scratch. System solutions based on well-developed products are definitely cheaper and more efficient. From the start of the project, there is an approved and innovative circuit design that meets the highest technological standards. First prototypes are readily available. Expenditures and waiting times for approvals are significantly lower and they are even totally excluded when it comes to minor adjustments. Since it is easy for the PULS production sites in Chi-

na and the Czech Republic to integrate Value-Add projects into their large-scale production, flexible production quantities are also possible. Prices remain stable and long-term availability can be guaranteed without discontinuation.

In the specific case of ASM, our Value-Add solution enabled the company to save more than one third of the calculated costs when compared to the purely client-specific offer. Thanks to the collaboration with PULS, ASM has gained much more than just a unique, cost-optimised power supply solution for a placement machine. The joint project has also created a close partnership between the two companies. It also created a reliable, modular basis which can be used for the power supplies of other ASM placement systems and subsequent machine generations.



**About PULS**

PULS is the only company worldwide focused entirely on the development and production of DIN rail power supplies. We concentrate our engineering knowledge, resources and energy on one goal: To be the best in this technology. As a result of this focus, our product families DIMENSION, PIANO and MiniLine set standards in terms of efficiency, size and service lifetime.

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