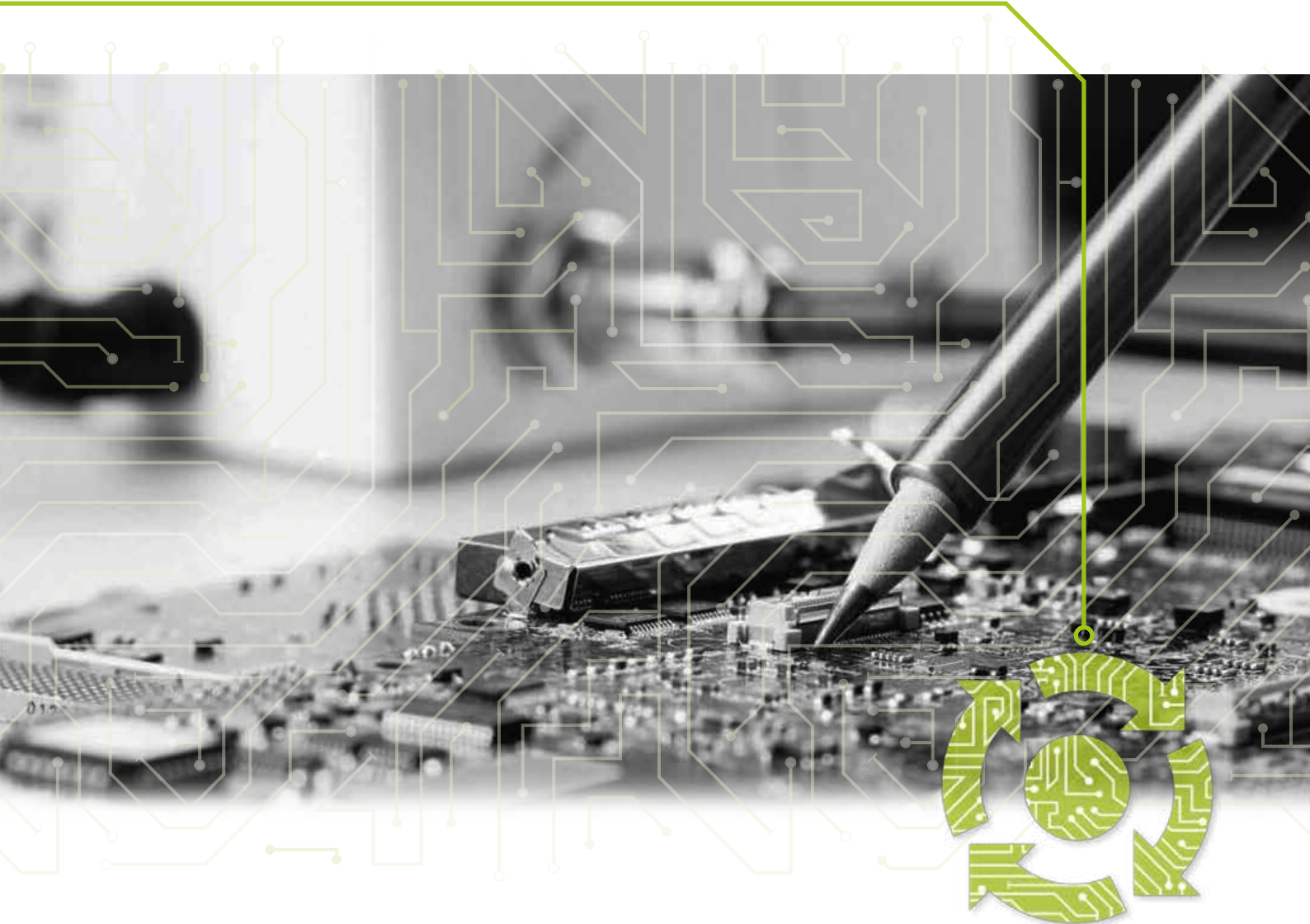


All-round LED solutions for industrial applications



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Preface

dilitronics
smartly driving LED



Stephan Schulz

CEO dilitronics engineering

Dear Partners,

We've been working with LED technology for many years now. This mode of illumination has already garnered a considerable market in all-purpose lighting. And yet, time and time again, product developers are faced with how complex and laborious it can be to develop, manufacture and profitably sell a reliable LED product.

At dilitronics, we've been developing and manufacturing LED products since 2008, and we've accumulated years of comprehensive experience in the field. In 2014, we decided to focus exclusively on industrial lighting solutions: LED applications in industrial settings where the LED light is not primarily serving the human eye, for example camera-based inspection or photochemical processes.

Over the years, dilitronics has become the perfect solution for this kind of application. Development and manufacture provided by one flexible, reliable partner. We are the ODM solution for our clients, helping them to quickly and flexibly achieve their most important goal: satisfied customers.

I look forward to a positive and cooperative partnership with you as we drive the success of LED technology in industrial applications – together.

Kindest regards from our Erfurt headquarters,

A handwritten signature in blue ink, appearing to read 'Schulz', with a long horizontal flourish extending to the right.

Stephan Schulz

Our task

Solutions for the most demanding industrial applications



Use of LEDs in industrial applications



Conquer problems, master challenging projects and seize opportunities - by taking advantage of diltronics engineering.

Providing LED solutions for industrial applications

LED technology is becoming increasingly popular in private, corporate and public lighting solutions. Beyond this, the versatility of Solid State Lighting technology in general makes it ideal for use in industrial applications. And not just for illuminating large industrial buildings; it is also ideal for use in machine vision and in industrial processes which necessitate extreme conditions such as exposure to fierce heat, strong electrical charges or intense vibration.

Why use LED technology in your technical facility?

- the light emission spectrum can be precisely configured
- accurate controls
- pulse tolerance
- high system efficiency

Which new challenges does this technology present?

- extreme demands on the hardware
- precise configuration options of the setup
- flexibly optimising and orienting the product for a new, developing market
- significantly reduced product lifespan
- developing specialist skills and processes, both internally and externally

dilitronics engineering combines years of extensive experience in product development and application with outstanding expertise in the field. Let us support you and make sure your product meets the high expectations you require.

Bringing LED technology into your industrial applications lets you add value to your product and get ahead of the competition with innovative leaps forward!

by the way:

Quality products, thoroughly checked:

We understand exactly what requirements you have for your product. That's why we test everything thoroughly, not only with the standard testing machinery but also with bespoke tools designed by us for maximum reliability.

LED applications

private/corporate

industrial

areas of application

optical
inspection

engineering

chemical
processes

Handling extreme conditions

- ✓ heat
- ✓ chemical emissions
- ✓ intense vibration
- ✓ extreme electrical charges

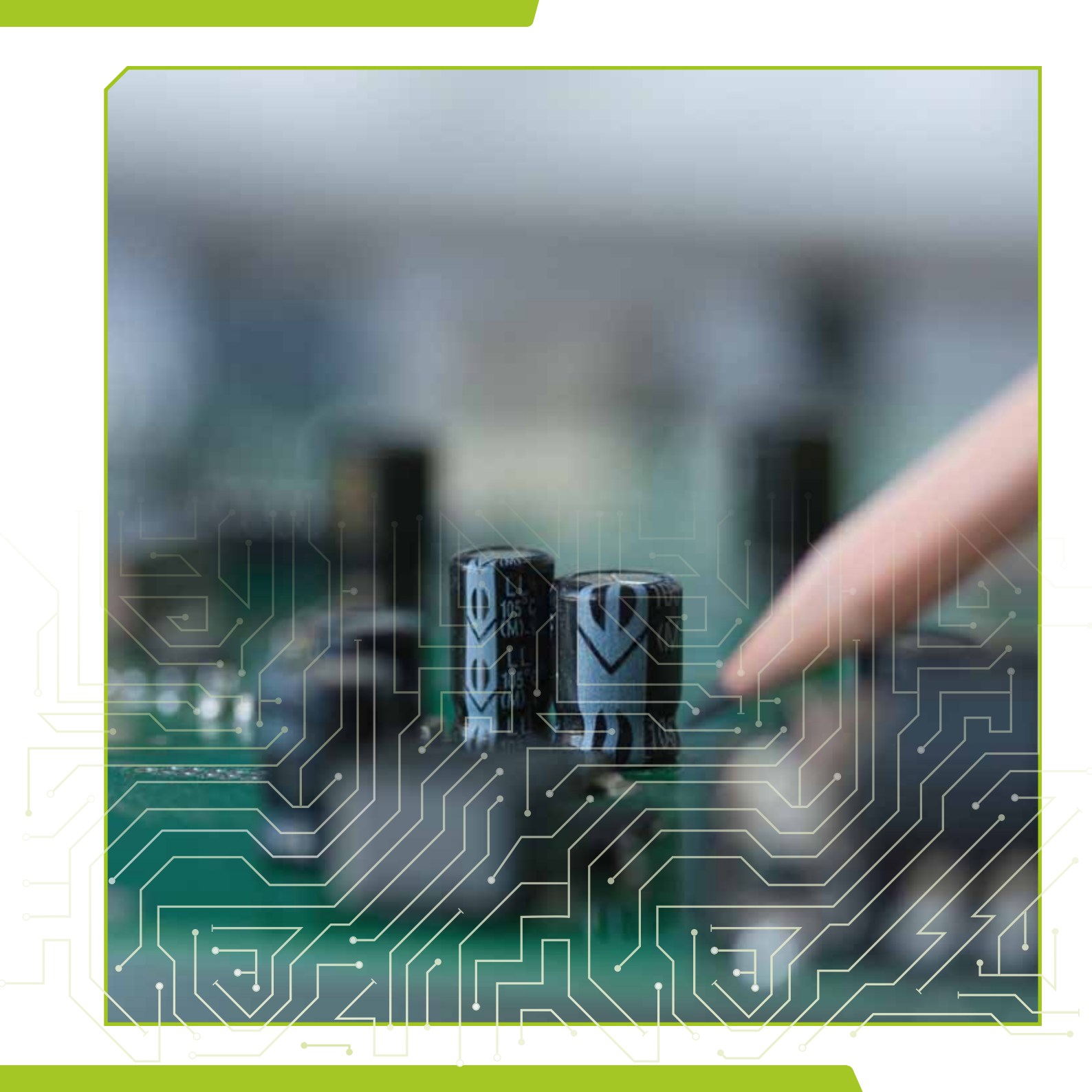
Let us show you how we successfully deal with these kinds of challenging conditions for a variety of different applications and requirements.

the solution

dilitronics
smartly driving LED

discover how...





Our services

LED all-round solutions by dilitronics engineering

Your one-stop provider of all-round LED solutions

● ● ●
We collaborate with a strong network of partners; this makes us a trusted one-stop solution for product development and production, with guaranteed quality and a fast turnaround.



Our all-round solution for industrial LED applications

Your benefits

Technical advantages

- ✓ one fixed contact person, with comprehensive training and technical expertise
- ✓ project development progresses quickly thanks to our modular building blocks

Quality

- ✓ we are entirely focused on providing the best possible service - meaning that we also provide products of the best possible quality
- ✓ our quality management is:
 - customer-focused
 - implemented across all processes
- ✓ the product is guaranteed to operate as specified, and is delivered ready to use

Your product

- ✓ top-range technology
- ✓ short time-to-market, thanks to efficient process management
- ✓ fast and responsive support and repair services in the unlikely event of an issue

Complex projects often require several different teams working together. This means that the organization, project management and communication needs for the project are intensive.

Our approach is a complete solution to this problem!

From the initial consultation to the after-sales service, we fulfil your requirements while making sure that the result is a much better end product. We create just the right solutions for you and your customers: quickly, flexibly and accurately.

What we do

Development, production and after-sales – we and our strategic partners have mastered all of these related processes, and we carry them out with confidence and care. With effectively coordinated communication and overarching interdisciplinary know-how, our systems offer you the perfect solution, all from just one provider. We'll be with you all the way, from the preliminary consultation to the final concept.

Our quality promise

We guarantee the highest possible quality for your product – quality made possible by the production processes provided by our certified strategic manufacturing partners, and assured by multiple highly thorough quality-testing procedures.



Process

Our services – your added value

1



Development

- + Thanks to our extensive experience and thorough understanding of the field, we overcome complications before they arise.
- + Use of a range of well-established, high-quality modular circuit blocks reduce turnaround time and allow us to solve your individual issue quickly.
- + Our specialist experiences in this field of applications allow us to avoid errors and time-consuming backtracking.

2



Production

- + Our comprehensive approach allows us to complete your project with optimal results, supported by our team of carefully selected partners.
- + Our strong network of long-term partners makes us highly flexible and able to maintain a reliable production chain.
- + This flexibility also allows us to manage a highly customer-oriented range of products and services.
- + Thanks to meticulous quality control in both our processes and those of our partners, we are able to uphold a zero-error policy.
- + We store your products safely and in appropriate conditions until you require them.

3



After Sales

- + Through transparent, efficient communication pathways, we work on a fast and practical solution for you and your customers.
- + Should you require after-sales service once the product is in use, our trained staff can carry out replacements or repairs for you, quickly and competently.

Production

How dilitronics engineering can support your project

Request

- extensive analysis of the requirements
- consultation

Project management

- direct communication with a fixed, trained contact person
- structured project documentation, continuously updated

Development

- prototype development
- iterative development processes
- intensive prototype tests through in-house real-world simulations of extreme situations
- module and system verification

Production

- production by quality-certified partners, audited by dilitronics
- double-checking of quality standards to the highest level: products are tested by the partners during the production process and receive secondary testing by us prior to delivery
- safe and appropriate storage of the product until the desired delivery date

After Sales

- continued support following implementation
- maintenance, repair and replacement services

Development and manufacture

Original Design Manufacturer



**Development and manufacture,
skillfully brought together**

• • •
In cooperation with our trusted partners, we take care of your product development, from sourcing the materials to assembly to installation.

LED driver development

Design Consulting

- ✓ developing a thorough understanding of the application
- ✓ defining maximum specifications
- ✓ elimination of costly design flaws

Engineering

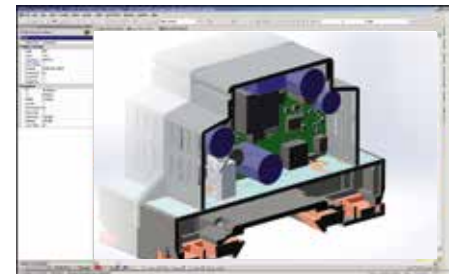
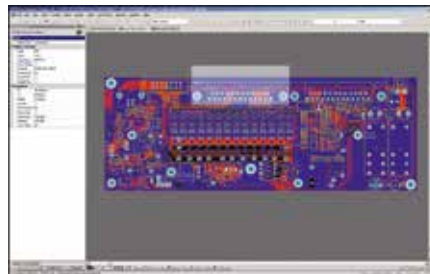
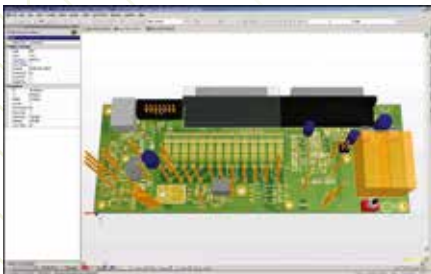
- ✓ finding the most robust solution
- ✓ creating designs for production and testing

Prototyping

- ✓ hands-on testing for optimal user-friendly design
- ✓ validating previous simulations

Tooling

- ✓ plastic injection moulding
- ✓ aluminium extrusion or die casting
- ✓ sheet metal construction



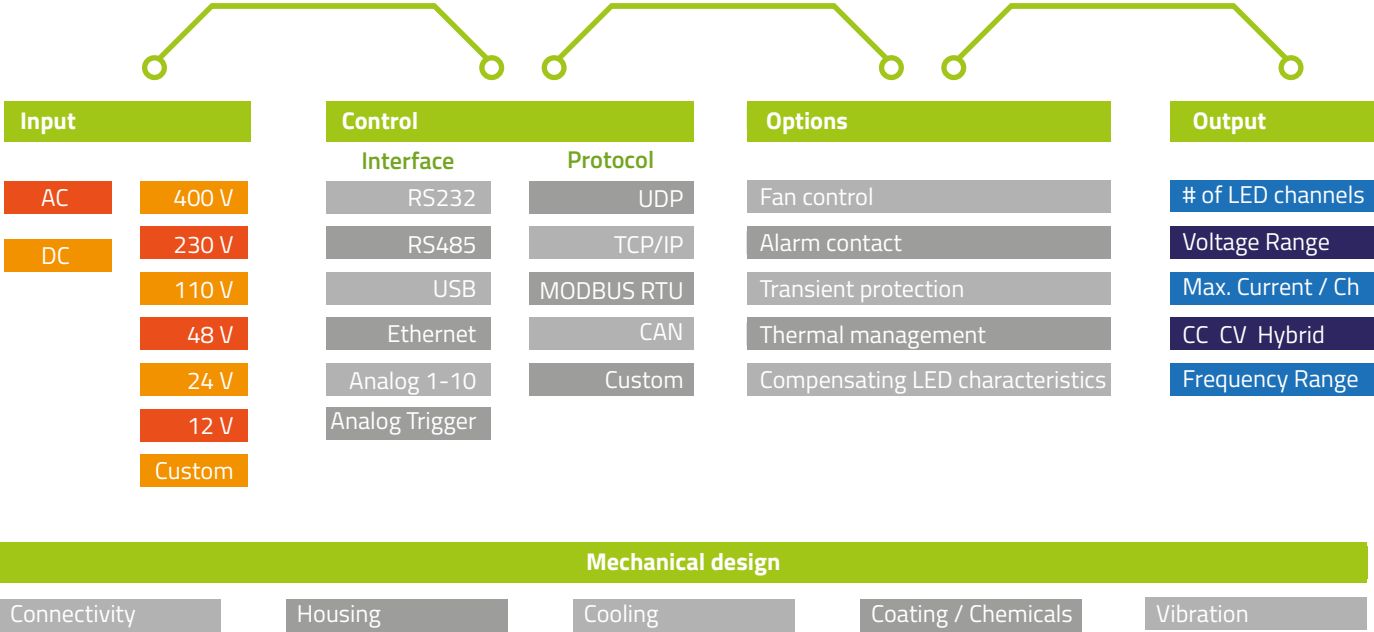
Our Modular Building Blocks



Every industrial application has a completely different set of requirements when it comes to LED solutions. By working through so many different projects, we have now accumulated comprehensive experience of varying applications. We've used this practical experience to put together a pool of high-quality, functional LED driver modules, which we call 'Modular Building Blocks'.

These modules are the basis for our high product standards, encompassing not only basic functions but also application-specific requirements. This means that our development process doesn't always start from a blank page; with this foundation in place we can give your individual needs our full attention and provide the best possible products, faster.

Choose your custom solution from our pool



From development to finished product

Development

Layout transfer

- PCB
- PCBA
- Mechanics

COB

- Clean room (ISO class 5 and 7)
- Chip-on-board
- Chip-on-flex
- Chip-on-Chip
- Flip Chip
- MCM

SMT

- solder paste printing
- application of SMD regarding component sizes down to 0201 (fine-pitch margin from 0.3mm)

by the way:

Strong team:

We are a Europe-wide team of 288 people including our suppliers, all taking care of your product.

by the way:

Strong partners:

With a sales volume of over €40 million (2015 data), our network of suppliers forms a strong, long-term foundation for our production chain.

THT

- wave soldering
- hot bar soldering
- hand soldering
- vapour-phase soldering
- selective soldering
- de-panelling

Protection

- sealants
- over-moulding
- coatings
- varnishes/lacquers

Installation

- casing assembly
- pad printing
- internal connection technology
- external connection technology
- cable manufacturing

Quality & Service

Our strategic partners in manufacturing

The choice not to set up our own manufacturing operations was a deliberate, considered decision. Instead of doing so, we decided to work with a network of steadfast partners, with whom we are able to offer all-round solutions to your projects according to your individual needs and requirements. Our perfectly organised systems and interlocking processes assure that the project will be carried out efficiently and to the highest quality standards.

Thanks to our supplier network, among whom we can reliably distribute our manufacturing batches, we are also always available for our clients, no matter how last-minute – even if one of our partners were to become unavailable. If a machine should be out of service or a supplier is unable to get hold of a specific material, we can easily and flexibly pass your project on to one of our partners. For you, nothing changes: your contact person, the progress of the project and of course the quality you receive remain the same.

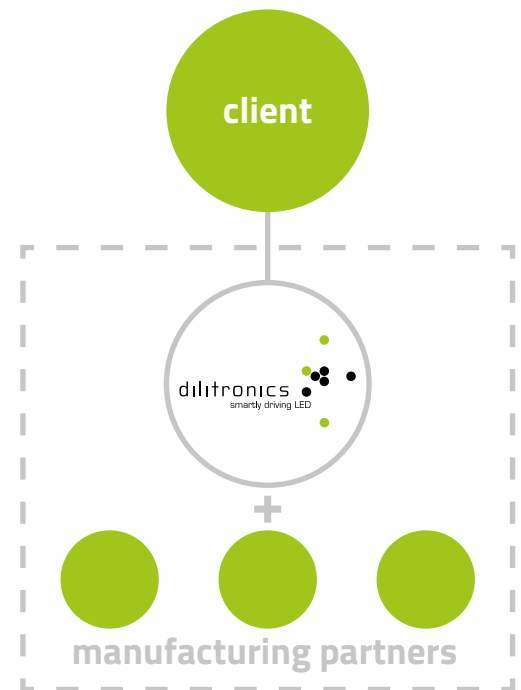
Our network – your benefits

- ✓ audited, certified partners
- ✓ stable production chain
- ✓ well-implemented processes ensure efficiency
- ✓ transparent cost structure
- ✓ risk is spread across multiple production partners
- ✓ allows us to focus principally on our clients and development processes

Virtual manufacturing

- ✓ seamless integration of product changes into serial production allows efficient adaptation to market requirements
- ✓ manufacturing problems such as component cancellation are solved by dilitronics – you order, we deliver
- ✓ a second-source strategy is automatically implemented in the above case
- ✓ flexible variant management significantly reduces time and cost expenditure for purchasing, development and project management on your part

Our strong partnerships make our all-round solutions possible. They provide the highest possible quality and efficiency, which gives us the opportunity to devote 100% of our attention to our clients.



Quality and service

Quality & Service

Quality control

- automatic X-ray inspection
- automatic optical inspection
- product-specific function checks
- in-circuit testing
- flying probe testing
- boundary scan (JTAG)
- burn-in testing
- test fixtures

Service

- materials management
- installation
- packaging
- delivery/transit
- after-sales service
- financial services
- logistics

dilitronics
smartly driving LED



Quality products add value

Production, processes, partners



**Quality products start with
quality consultation.**



We don't just promise quality; we guarantee it. Discover your potential added value with dilitronics engineering.

Our promises for quality

Your benefits

Technical advantages

- ✓ faster development through consultation and analysis of the problem
- ✓ debugging through intensive real-world simulations of the particular demands of each individual application – prior to and after manufacture

Purchasing

- ✓ minimised risk thanks to our guarantee
- ✓ quality management which goes above and beyond the standard
- ✓ reliable and assured, thanks to flexible variant management
- ✓ your contact person maintains an overview of all processes

Your product

- ✓ two inspection phases
- ✓ improved quality due to verified, standardised development processes
- ✓ distinct qualitative selling points give you a market advantage

Quality begins with your individual needs...

...this is why our work and our product testing always reaches and exceeds existing industry standards. With our carefully selected team of staff, network of strategic partners and range of manufacturing materials, we've laid the foundation for high quality service – which we make a reality in development, production and all other processes associated with the products in question.

Two is better than one...

...which is why the products manufactured by us and our strategic partners are tested twice: once by our partners, who ensure that the production conforms to ISO 9001 and ISO 16949, and a second time by us with intensive quality checks. Only then products are sent out to you. We don't just meet our quality targets through our double-tested products but also through our optimised and highly efficient processes, assessed to the same high standards. These established and verified standards make sure that we successfully provide a finished, market-ready product, ensuring that the product also undergoes continued improvement.

Take advantage of high quality service – guaranteed!

Our focus on quality is driven by just one goal: to ensure your long-term market advantage. Your product receives continuous qualitative improvements and you get the reassurance of knowing that this will still be the case moving forward. We're so confident of this that we guarantee your product will work according to your specifications!

dilitronics-Continuous Supply

It's our goal to provide you with the products and services you require, flexibly and whenever you need them. Together with our strategic manufacturing partners, and upheld by our robust production processes, we bring your whole project to fruition – safely, efficiently and hassle-free. All the way through, from development to production to maintenance, your fixed contact person is at your service.

Your benefits

- ✓ In the event of a component cancellation, we take responsibility for sourcing an alternative or reengineering the product if necessary – transparently and cost-neutral.
- ✓ dilitronics engineering always provides you with the latest approved version of the product.
- ✓ In the case of a framework agreement, you are only required to consume the safety stock. The stock in question will be delivered fully up-to-date as per the terms of your order, provided that any modifications to the product do not necessitate significant changes to the cost structure of the project.

We understand your product down to the last milliamp; our manufacturing partners understand their craft down to the tiniest nooks and crannies of the soldering profile. The result: you place your order, we deliver punctually and with the product's correct function guaranteed.

Specification

Development

Verification

Production chains

Product series

After Sales

We'll take care of it all for you:

- component cancellation
- supply bottlenecks of primary products
- product optimisations
- new variants

8 reasons for dilitronics

1 We are the experts in LED drivers for industrial applications

Our team brings together numerous years of experience working with different industrial applications with theoretical and practical know-how in and around the field. Our carefully selected in-house experts have the interdisciplinary qualifications and the skill to take care of your project, with results of the highest standard.

2 Efficiency

Efficiency means real added value. Thanks to quick development and manufacturing, plus our experience and know-how, we effectively reduce the project's turnaround time without sacrificing the high quality standards you expect. We know all the typical problems, anticipate the more unusual issues, and take care of what causes them. We preserve your resources: for example by spreading out the tasks among our network of production partners or by arranging collective purchase orders according to the product standards.

3 Flexibility

As a client-oriented company, our systems allow us to be particularly flexible in several areas: in development, due to our processes, which are optimised to suit your needs; through our variant management; and due to our network of strategic partners, which in turn allows us to independently manage the production phase.

4 An all-round solution

Together with our strategic partners, we offer comprehensive services and project management to match. We'll take care of 100% of your project – easily, reliably, efficiently, with just one fixed contact person by your side, from the initial consultation through to the after-sales maintenance.

5 Quality – the dilitronics engineering guarantee

Quality is our top priority. And not just for products we develop – which we test thoroughly during development, are tested again by our partners during production, and finally once again by us in our facilities. We also make sure that our extremely high standards are always being reached by our processes and our partners. That's why we offer our guarantee – with confidence!

6 We're not alone – strong partnerships

When you work with us, you don't just profit from the dilitronics team's considerable know-how and years of experience; you also take advantage of a whole curated network of strategic partners. Together, we ensure a stable, time-efficient and resource-saving production chain for every single one of your projects. In addition, you receive guaranteed top-quality service thanks to our shorter communication pathways, regular audits, meticulous understanding of the processes involved and intensive quality control.

7 Problem-solving – our focus

By specialising in LED drivers for industrial applications and using our 'Modular Building Blocks' as the foundation of our work, we are able to focus our entire attention on your individual project; by doing so, we deliver results with the best possible quality and with a quick turnaround.

8 A client-oriented partner

At dilitronics engineering, we see ourselves as your partner – loyal and always reliable. We don't develop our own products – only the products uniquely developed for you in your project. Our task is your application; our motivation is your success.

The company

Vision, mission, guiding principles

**dilitronics – your trustworthy
partner with transparent values**



Forward-looking in development, steadfast in our values;
that's how we live up to our company vision every day.



Vision

Our electronics drive the success of LEDs in industry.

Mission

In demanding environments and under the most extreme conditions, our products create and control functional lighting, precisely and reliably. We are your partner providing effective LED implementation in industrial applications. And we take partnership seriously: we support our clients from the initial idea to the finished product, every step of the way. With our know-how and constant direct support, we deliver a uniquely high level of value that our clients prize. Fast like no other, innovative and instinctively cutting-edge; these characteristics are the cornerstones of our work and make us a valuable partner ensuring the success of all stakeholders!

Our guiding principles



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