

## Cover Story

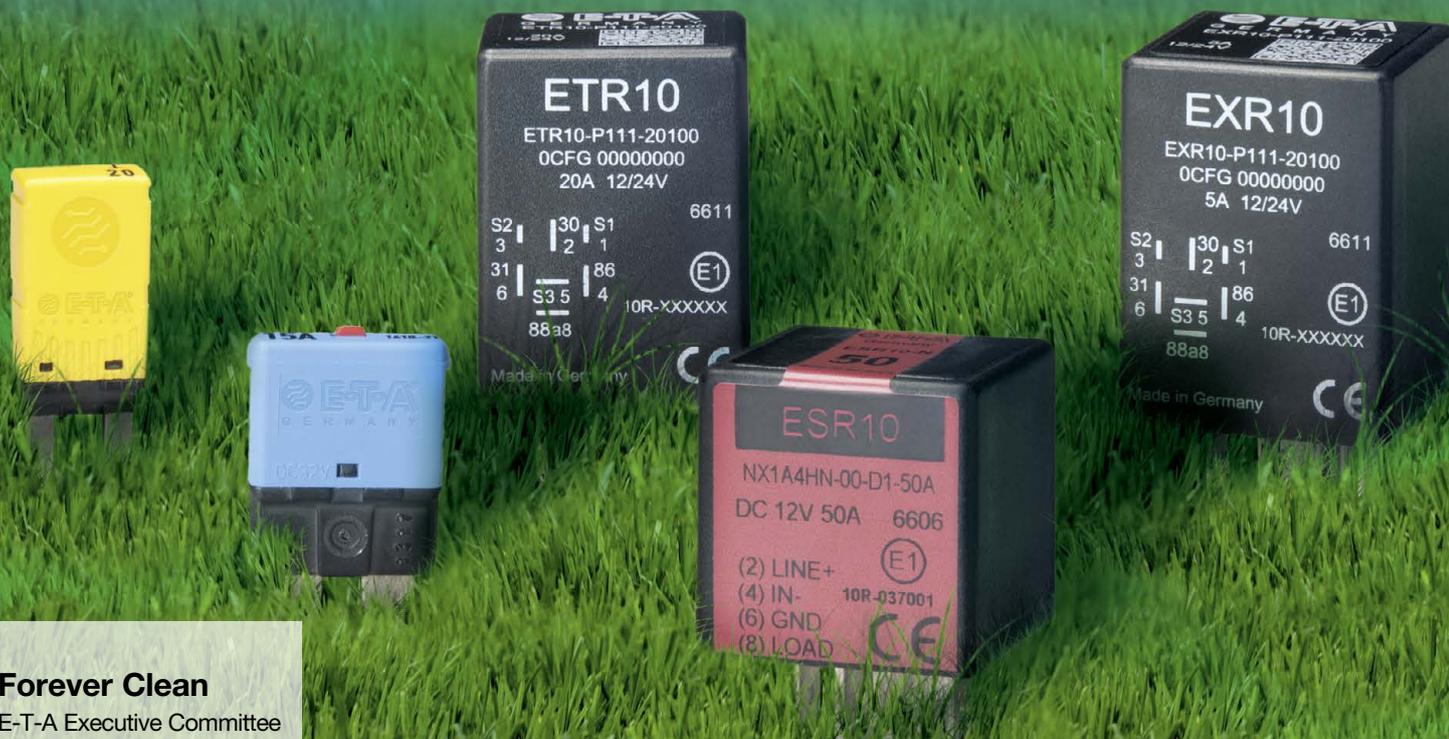
E-T-A products help to save material and energy

## Presenting new family members

New smart solid state relays

## Vital electrical systems in London Ambulance Service Response Cars

Protected by **PowerPlex**<sup>®</sup>



### Forever Clean

E-T-A Executive Committee  
Dr. Clifford Sell about  
environmental protection



## 4/5

New smart solid state relays  
Presenting new family members



## 6/7

E-T-A products help to  
save material and energy



## 10

FAQ – Frequently Asked Questions  
All you ever wanted to know about  
E-T-A products



## 15

Typically English  
»Farmhouse Chicken«

Editorial	3
New smart solid state relays Presenting new family members	4/5
E-T-A products help to save material and energy	6/7
Overcurrent protection for nut roasting machines	8
Personnel	9
FAQ – Frequently Asked Questions	10
Good Practice Smart electrical systems in boats and special vehicles	11
E-T-A solutions for many products	12/13
Vital electrical systems in London Ambulance Service Response Cars protected by <b>PowerPlex®</b>	14
Typically English »Farmhouse Chicken«	15

### Front page:

Circuit breakers 1620 and 1610, solid state relays ETR10, EXR10 and ESR10

## Impressum

**Current**, Customer Magazine of E-T-A  
Elektrotechnische Apparate GmbH

### Editor:

E-T-A Elektrotechnische Apparate GmbH  
Industriestraße 2-8 · 90518 Altdorf GERMANY  
Phone: +4909187 10-0  
Fax: +49 9187 10397  
E-Mail: info@e-t-a.de · www.e-t-a.de

### Responsible:

Thomas Weimann

### Layout:

E-T-A Communications Department

### Photos:

E-T-A, Fotolia.com

### Circulation:

2,000 pcs

Environmental protection is a hot topic and there is rarely a company today that would not claim its commitment to environmental protection. However, if we really want to preserve this world for the next generation, environmental protection must be more than just paying lip service. This is true for individuals, but even more for companies. It includes a range of different aspects, including production, products and acting ecologically on a daily basis.



E-T-A products are not only produced as environmentally sustainable as possible, but they frequently represent a contribution to ecology by being what they are. For instance, this is true for the circuit breakers product group. Contrary to a standard blade fuse, a resettable circuit breaker can be used time

and time again while a fuse will have to be thrown away once it's blown. Recycling is not always possible.

In addition, environmental aspects strongly support the use of E-T-A's products particularly in the automotive sector. Using automotive circuit breakers helps to reduce cable harnesses in passenger cars and trucks. This helps to save weight and gas and reduces CO<sub>2</sub> emission.

You see, environmental protection begins with seemingly small actions. Let us work together on initiatives, big and small, that contribute to preserving the earth. **Time is short.**

**Forever  
clean**

E-T-A is a company with more than 60 years of tradition and we committed ourselves to environmental protection very early on. Our ISO14001 certification helps us to emphasise what we have done in practice for many years. For example, we installed environmentally friendly illumination in all our work processes and stations. After all, acting environmentally sustainably is in most cases also economical, although many people tend to think otherwise. It just shows us how relevant the issue is.



Dr. Clifford Sell

Executive Committee  
E-T-A Elektrotechnische Apparate GmbH



At a glance –  
new solid state relays

- **ESR10 Maxi** – solid state relay in ISO Maxi automotive relay enclosure rated to 50 A
- **ESR10 Micro** – solid state relay in ISO Micro automotive relay enclosure rated up to 30 A
- **ETR10** – solid state relay in ISO Mini automotive relay enclosure rated up to 30 A
- **EXR10** – solid state special relay in ISO Mini automotive relay enclosure rated up to 30 A



New smart solid state relays

## Presenting new family members

We all know the E-1048, with all of its different versions, is suitable for use in 12V and 24V vehicle systems. It combines relay and protective functionality in one device, which helps drastically reduce installation efforts. The protective function is resettable, which increases availability and makes manual access to the device unnecessary - not even for resetting the protective function. The relay is extremely robust and is tolerant to dust, dirt, shock and vibration and has a very low innate consumption.

All these benefits make the E-1048 ideal for use in a range of very diverse applications including: utility vehicles as well as passenger cars and even motorcycles. The new family members ESR, ETR and EXR are also ideally suited for these applications.

ESR, ETR and EXR - what are the products behind these new names? They represent a growing number of versions and advancement in technology.

### What are the technical innovations?

The ETR10 is the E-1048 with an integral timer function. In addition, it features an ON and OFF delay, pulse or frequency output as well as many additional functions. Like the E-1048, the ETR10 also offers a protective function and can indicate wire breakage (upon request). The EXR10 has even more diagnostic functionality. It can detect and indicate undervoltage. The levels are adjustable based on the application.

E-T-A's product innovation not only added new products to the relay family but also



New E-T-A solid state relays:  
**ESR10 Micro, ETR10 and EXR10**

introduced new features to the existing product line. E-T-A recently launched a new version of the E-1048-8D rated to 50 A – which is called the ESR10 Maxi with Maxi denoting the ISO Maxi enclosure type.

### Micro for high volumes

E-T-A also designed a Micro solid-state relay specifically for high volume orders requiring 10 A continuous current. The very flexible activation makes it easy to replace standard electro-mechanical relays. This is appealing for all types of applications where: the switching noise of mechanical relays is considered disturbing, frequency control is required (PWM), „high“ control current or limited endurance calls for an alternative.

**Do you want to learn more about E-T-A's family of relay products? We look**

**forward to speaking with you! Of course you can find all relevant information on the E-T-A website.**



More information?  
Just scan the  
QR-Code!

**Save natural resources with circuit protectors:**

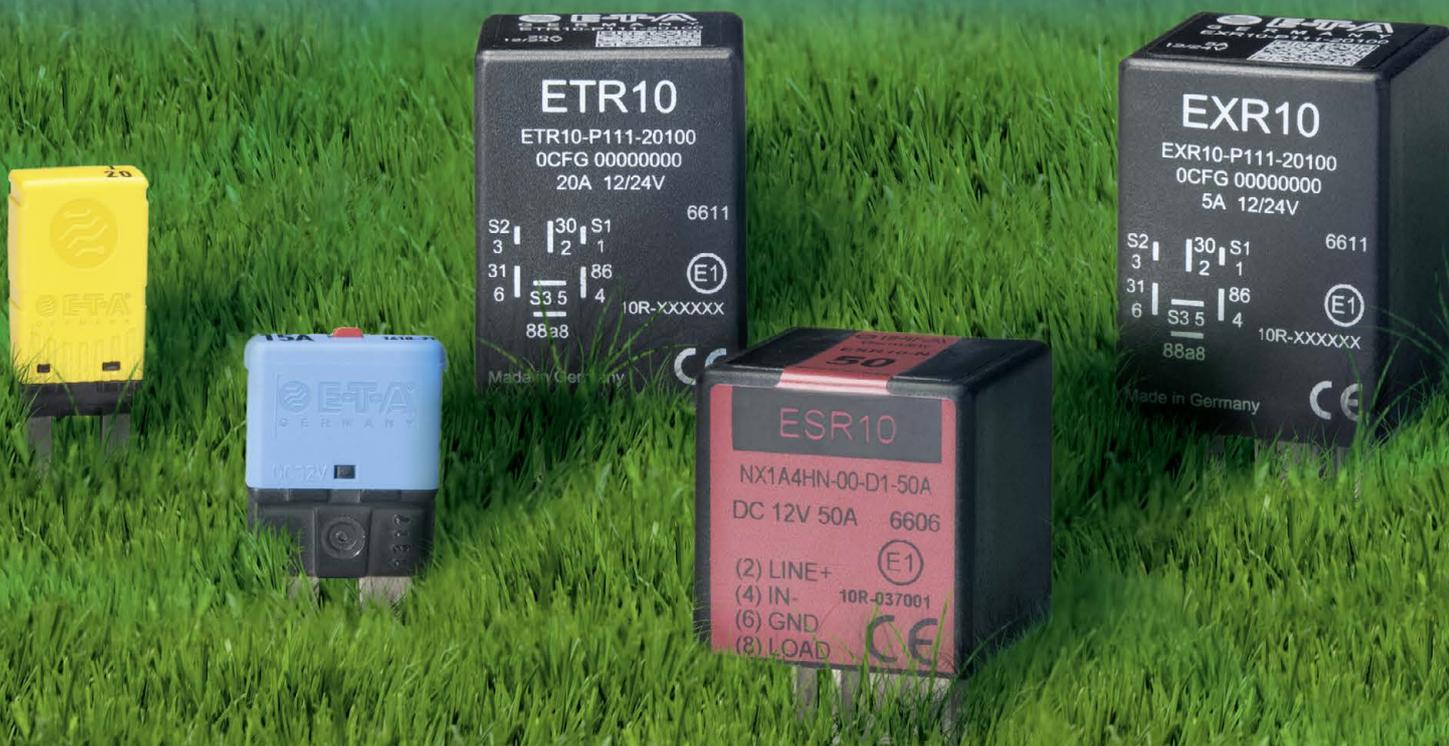
- 1:1 replacement of fuses
- reduced downtimes because of immediate resettability

**Reduce energy consumption with solid-state relays:**

- low power consumption of the semi-conductors
- no contact-wear, resulting in nearly unlimited endurance

**Avoid power loss with electro-mechanical power relays:**

- reduce weight and power consumption through state-of-the-art technology



E-T-A products help to save material and energy



## For the sake of the environment

©Leonid Ivan/Fotolia.com

Sustainability is the talk of the town. But what does it mean in the automotive industry? For many car manufacturers, it is not only a question of reducing gas consumption or CO<sub>2</sub> emission, but it is also a question of raw materials. The use of recyclable components in vehicles is incredibly important. Similar to other industries, components in car production should be used several times. The technical complexity often presents a huge challenge for car manufacturers. E-T-A products help to conserve natural resources. This is not only attained by implementing environmentally friendly production methods, but also by simply using E-T-A products in the vehicles.

### Circuit breaker vs. fuse

A cheap disposable fuse made in the Far East can be replaced by the 1610 and 1620 modern resettable circuit breakers. Although these parts will cost a few cents more, they will last the lifetime of the vehicle and are resettable. Reliability and constant availability do not only enhance user convenience, but also help to avoid downtime of construction vehicles and trucks.

Circuit breakers do not age, characteristic curves are specified much more precisely than a fuse and they are calibrated and 100% tested. This allows for a precise dimensional design of the cable harness because it is no longer necessary to design safety reserves into the cable cross section to compensate for fuse tolerances. In a normal passenger car you will find cable harnesses that are several kilometres long and weigh between 50 and 100 kg. It is quite obvious that reducing cable cross-sections will help save several kilos of raw material.



Protecting environment and resources:  
E-T-A products 1610 and 1620, ESR10, ETR10 and EXR10

### The next relay generation

The ESR, ETR and EXR solid-state relays made by E-T-A offer a nearly unlimited number of switching cycles without any mechanical parts involved, making the device wear free. In addition, the energy consumption is considerably lower than with standard relays. Up to now, currents in the 100 – 300 mA range were required whereas solid-state relays can function with less than 1 mA. Meanwhile, more and more loads are switched off during driving to save energy. This would consume energy when using an electro-mechanical relay but not so with the new solid-state relays. When handling such a high number of switching cycles occurring in an energy-efficient system, a standard relay would reach its limits very quickly and would have to be replaced quite frequently.

The solid-state relays help save some wattage, but the power relays required for buses, construction machinery and agricultural vehicles quickly save 10 Watts or more. These power relays are used to disconnect the entire on-board electrical system. Until now, mostly monostable

versions are being used, i.e. they are permanently energized. When starting the vehicle at the beginning of a work shift, this means continuous duty of more than 10 W in service. Modern bistable power relays, such as E-T-A's MPR10, only require a short current pulse for switching ON or OFF. When estimating a value of 1 g CO<sub>2</sub> emission per Watt, this amounts to 80 g CO<sub>2</sub> during an 8-hour working day.

**All this illustrates the eco-friendliness of E-T-A's components and solutions.**

# Overcurrent protection for nut roasting machines

E-T-A circuit breaker types 3120 and 2-5700 in nut roasting machines branded "Mandelprofi" made by MVS



Horst Bode, Managing Director of MVS Metallverarbeitung Sondermaschinen GmbH

MVS Metallverarbeitung Sondermaschinen GmbH, located in Garching near Munich, has over 25 years of successful production experience and produces high-quality nut roasting machines called Mandelprofi for indoor and outdoor purposes. Its best-

selling product is an elegant tabletop unit called „mini electric“ which features a versatile and compact design so that it can be used in shopping malls as well as railway stations, at Christmas markets and in pastry shops. The Current talked to Managing Director Horst Bode about the use of E-T-A's thermal circuit breakers.



Used all over the world: nut roaster tabletop unit

**Current:** Everybody knows sweet roasted almonds in Germany. Are they just as popular abroad?

**Horst Bode:** Yes, absolutely. Roasted nuts are much sought-after around the globe. We receive orders for our machines from all over the world. Only recently did we deliver nut roasting machines to New Caledonia in the South Pacific Ocean and to Dubai.

**Current:** How did you find out about E-T-A?

**Horst Bode:** Good question. Frankly, I do not really recall it any longer, because we have been using E-T-A circuit breakers for over 20 years. Thanks to their robust design they work in our machines very reliably. Therefore we never saw the necessity to consider alternatives.

**Current:** In other words: The robust design is quite essential for your application?

**Horst Bode:** Yes. You can certainly imagine the extraordinary strain to which

our nut roasters are subjected daily, e.g. on a fun fair or in an amusement park. E-T-A's circuit breakers have never left us in a pinch.

**Current:** Which E-T-A circuit breakers do you use in your mini electric tabletop unit and what do they do?

**Horst Bode:** We install E-T-A's 2-5700 and 3120 circuit breaker types into our

mini electric. The 2-5700 protects the heaters and the 3120 protects the mixer motor of the roasting machine and serves as the ON-OFF switch of the mixer unit.

**Current:** Thank you for your time.



E-T-A circuit breakers type 3120 and type 2-5700



More information? Just scan the QR-Code!

### Kevin Sims



Kevin joined the E-T-A US Sales and Business Development team throughout the second half of last year. Before joining E-T-A, Kevin worked for many years as

Product Specialist at several big players in the industry in different roles where he

took care of circuit breakers and related products. Based on that knowledge and experience he is the perfect candidate to work directly with channel partners and OEM's in the Automation and Process Control market. In his role at E-T-A, Kevin is responsible for supporting all areas within the APC market. Kevin works directly with Dean Latham to support customers with E-T-A's mission as a circuit breaker solutions provider.

### Dean Latham



Dean is member of the E-T-A US Sales and Business Development team since middle of last year. Before joining E-T-A, Dean spent many years as a Business

Unit Manager and Electrical Engineer at renowned companies in the business.

Together with his colleague Kevin Sims, Dean is responsible for taking care of customers and distributors in the area of APC. His long-term experience in engineering, sales, and business management will help him to create innovative and practical circuit protection solutions with and for his customers in the US market.

### Thorsten Fertig



Thorsten Fertig joined the E-T-A's German Sales Team in autumn of last year. Thorsten is responsible for the Southern Bavarian region with an office is located in Munich.

He was trained as a technician for communication electronics and then graduated in Electrical Engineering at the Technical University in Munich. Over the past few years, Thorsten worked for a renowned German manufacturer of switch-mode power supplies.

It is Thorsten's goal to offer the best possible service and advice to the customers in his sales territory with regard to E-T-A's product range. Together with his colleagues at Headquarters, he will support the customers to design and develop optimised and cost-effective protection concepts for their individual applications.

### Thomas Beßler



Thomas Beßler joined E-T-A on 1st October 2013 as a member of the Global Sales Center at E-T-A Headquarters in Altdorf. As a Senior Engineer, he supports customers

in Germany and Europe with technical questions about E-T-A's broad product range.

As a Graduated Engineer specialising in Electrical Engineering, he has a wealth of knowledge to offer and support the E-T-A team. After graduating at the Technical University Ilmenau, Thomas started as an Application Engineer for robotics and

before joining E-T-A, he had worked as a technical consultant in the sale of industrial drive technology products for more than ten years.

The experience he has gained during his career will be beneficial to both customers and colleagues in Germany and Europe.



Our FAQ pages are meant to intensify the dialogue between manufacturer and customers. We discuss topical subjects from practice as briefly and yet as detailed as possible to support you in your daily work. Do you have any questions you need answer to? Send it to us - we are looking forward to hearing from you.

**E-T-A Elektrotechnische Apparate GmbH**

**Keyword: [Current FAQ](#)**

**Industriestraße 2-8, 90518 Altdorf**

**E-Mail: [faq@e-t-a.de](mailto:faq@e-t-a.de)**

## EU directives for a better environment - can circuit breakers be „green“?

### What environmental EU directives are relevant for E-T-A products?

There are 3 EU directives to regulate environmental aspects during production, usage and disposal of electrical and electronic devices<sup>1</sup>: WEEE, RoHS and REACH.

### What does WEEE mean<sup>2</sup>?

The purpose of the 2002/96/EG EU directive is environmental protection. The goal is to avoid waste and to increase recycling. E-T-A discusses environmentally-friendly product disposal as early as the design phase of product development.

### What does RoHS mean<sup>3</sup>?

The 2011/65/EU RoHS directive regulates the use of certain hazardous substances in EE<sup>1</sup> within the EU. All corresponding products must be marked with the CE logo. Limit values have been established for Cd, Pb, Hg, Cr VI, PBB and PBDE<sup>4</sup> ("Dirty Six").

### What does REACH mean<sup>5</sup>?

The 1907/2006 EU regulation controls the use of chemicals in general. There are materials that must be regulated on for quantities of 1t/a plus. When using materials without a quantity threshold, there must be a safety data sheet available.

### Are there corresponding regulations outside the EU?

In China, China-RoHS and a China REACH are being worked on. Currently there are not legal requirements in Japan or the USA. South Korea announced a corresponding legislation. In many other countries, e.g. India, Taiwan, Malaysia, Australia and New Zealand, similar directives are expected in the near future.

### How are these directives applied in Germany?

The ElektroG<sup>6</sup> (Electrical and Electronic Equipment Act) is the national implementation of WEEE and RoHS. Manufacturers and importers must register with the EAR<sup>7</sup> ensuring acceptance of EE<sup>1</sup>. Switchgear is not included in the ElektroG, but monitoring and control units are.

### How does E-T-A apply these directives?

The exact material composition of our products is stored in E-T-A SAP system and can be verified with an X-ray tester without destroying the product. Except for some electronic components, which are not yet available lead-free, all E-T-A parts meet the requirements of the directives. E-T-A is registered with EAR<sup>7</sup>, but only few devices are actually subject to the ElektroG and safety data sheets

are available for all auxiliary materials used. We mark our products with the CE logo and confirm the conformity with the harmonised EU directives and regulations.

The only officially mandatory logo for EE<sup>1</sup> within the ElektroG is the crossed out dust bin. We use the CE logo for our devices.



- 1 Electrical and Electronic Equipment (EE)
- 2 Waste of Electrical and Electronic Equipment
- 3 Restriction of the use of certain Hazardous Substances in electrical and electronic equipment
- 4 Cd Cadmium, Pb lead, Hg mercury, Cr IV hexavalent chromium, PBB polybrominated biphenyls, PBDE polybrominated diphenylethers
- 5 Registration, Evaluation, Authorisation and Restriction of Chemicals
- 6 The Act Governing the Sale, Return and Environmentally Sound Disposal of Electrical and Electronic Equipment
- 7 Elektro-Altgeräte-Register

# Smart electrical systems in boats and special vehicles

Software enhances flexibility of  
power distribution



Dipl.-Ing. oec.  
Diana Schurig,  
Marketing-Manager of  
E-T-A's WSV Division

Customer-specific  
special accessories  
and retrofits are  
always a challenge  
when installing an  
on-board electrical  
system.

**PowerPlex®** allows  
you to flexibly respond  
to customer  
requirements.

**PowerPlex®** connects, regulates, controls and monitors electrical loads, switches and sensors via CAN. The entire system behaviour is determined by the system configuration, which is created in the PowerPlex® Configuration Software and transferred to the **PowerPlex®** components.

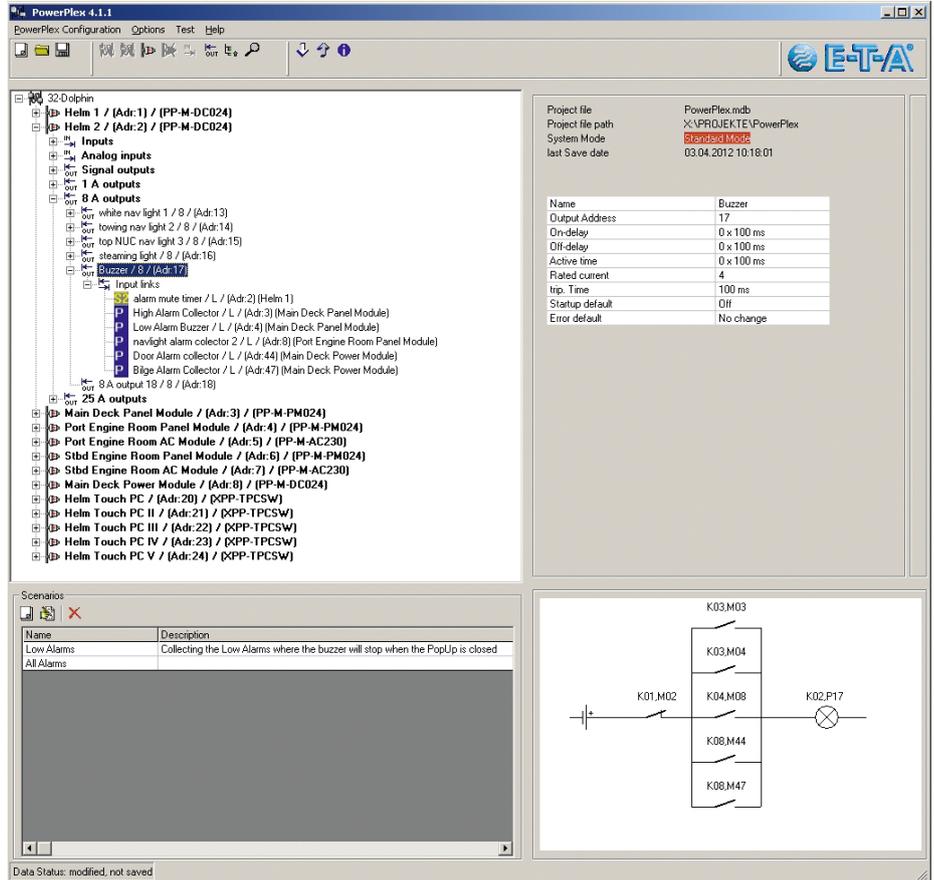
When designing a **PowerPlex®** system there are two major factors:

- total overall number of loads and sensors which must be included
- ideas of the desired control and monitoring functions

While the first factor determines the number of **PowerPlex®** modules, the second determines the system behaviour.

## Divide system behaviour into function blocks

Forming function blocks facilitates the preparation of the configuration. A function block is a narrowly defined control function, such as switch-on of illumination or switch off the pumps when pre-defined tank levels are reached as well as a simultaneous visual alert on the display.



Engineering solutions for unrivalled flexibility – **PowerPlex®** Configuration Software

## System test simulation with the test & debug mode

The test & debug mode allows testing and analysing the system - immediately after transferring the configuration. Set-up of a test system helps to save valuable time when setting up the configuration and avoids possible delay times when starting up the entire system.

## Configured instead of programmed

In a sample set-up or in the field, the user often sees which functionalities are reasonable and really required. But it is also possible that a customer may want more reading lamps and switches. **PowerPlex®** provides the necessary flexibility to accommodate these modifications at any

time. For changing control options in the on-board electrical system you only have to adjust the configuration and re-transfer to the modules. The only thing you should do upfront is to interconnect the additional loads in the system.



More information?  
Just scan the  
QR-Code!

## E-T-A solutions for many products

*E-T-A offers tailor-made solutions for a wide range of industries and products. Here are some interesting examples.*

**Application:** Protection of measuring resistors  
**E-T-A type:** SBG-808-16-V0059

The Bayer Crop Science headquarters is located in Monheim on the Rhine. They investigate, develop and test innovative plant protecting agents that defend against vermin, fungus and weeds. In their research laboratories, the data of the many sensors, e.g. for temperature, humidity etc., are forwarded to the inputs of the evaluation units 20 mA analog measuring signals. In the event of a failure, overcurrents can destroy the measuring resistors, which are not short circuit proof. E-T-A's 808 magnetic circuit breakers, with manual release button, are designed into the power supply to prevent this from occurring. They have a significantly lower voltage drop than high-resistive microfuses. The DIN rail mounted power distribution system includes 16 ways in addition to auxiliary contacts and voltage monitoring. The instantaneous tripping characteristic of the 808 helps reliably prevent the destruction of the sensitive measuring inputs and the need to replace the measuring boards. The fast acting mechanism also helps prevent lengthy disruptions of the time-consuming recording of the test series during product design.

**Application:** Photovoltaic system on the roof of production facilities  
**E-T-A type:** PVSEC-...

RAFI Eltec is a major technology service provider that designs and produces electronic sub-assemblies and systems, from the idea to the final product, based on customer-specific requirements. They have more than 280 people on the payroll. RAFI Eltec installed a 223 kWp photovoltaic system on the roof of their new production building in Überlingen. The energy created there covers part of the power requirement they have in production. They use E-T-A's PVSEC firefighter switch for the DC disconnection of the PV generator, which is mounted

directly beneath the module racks in weather-proof generator connection boxes. Control and monitoring of the firefighter switches is provided by an automatic system.

REHATEC, the planning office, designed the system and it was then installed by Reimer-Elektrotechnik located in Neu-Ulm. Reimer-Elektrotechnik offers various services required in connecting photovoltaics, including design, installation, safety check and maintenance.



# Applications

**Application:** Transportation Vehicles

**E-T-A types:** 1170, Battery Isolation Switch BTS

When it comes to transporting goods on the road, Daimler TRUCK vehicles are at the forefront. The Mercedes Benz ACTROS, for heavy goods vehicle traffic, and the ATEGO, for distribution traffic, help to reliably and efficiently meet the customer's requirements - all over the world! Daimler's motto, „Trucks you can trust“, is also supported by E-T-A's products. For instance, E-T-A's 1170 circuit breaker is used as

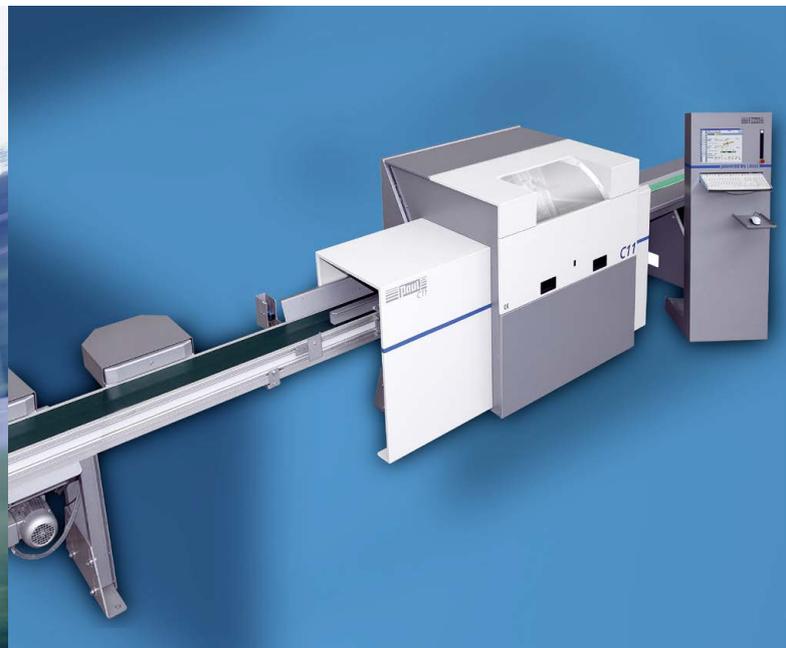
a fuse replacement device in the special equipment of the vehicles. They ensure greater availability compared to standard blade fuses. Additionally, there is a CAN-bus-capable battery isolation switch made by E-T-A installed in ACTROS and ATEGO trucks for the transportation of hazardous goods. They provide the technical features to meet the Ex protection requirement.



**Application:** Woodworking machines

**E-T-A type:** ESX10-TD

The Paul Maschinenfabrik GmbH & Co KG located in Dürmentingen, Germany, is one of the world's major manufacturers of woodworking machines and machines for the production of prestressed concrete (PC). The company was founded in 1925 and has approximately 250 people on the payroll. Thanks to highly innovative products they have an export share of 80 %. Paul uses E-T-A's electronic circuit protectors type ESX10-T for the protection of DC 24 V circuits because the product offers a combination of active electronic current limitation in the event of a short circuit and an overload disconnection from 1.1 times rated current and reliable and selective load protection, independent of cable cross sections and lengths. This reduces the chance of inadvertent machine downtimes. For logistic reasons Paul selected the TD design version with auxiliary contacts and slide switch that has a 3-step current rating adjustment.



# Vital electrical systems in London Ambulance Service Response Cars

Protected by **PowerPlex®**

The London Ambulance Service NHS Trust planned to upgrade the vital electrical power distribution systems in its First Response car fleet. They liked E-T-A's **PowerPlex®** system from the start and chose it to maximise the up-time and availability of its fleet.

Three **PowerPlex®** Compact Modules were installed per vehicle as part of a decentralised electrical power distribution system. The modules control and monitor all installed electrical loads and protect them and the electrical harness against overcurrent and short circuits. They can also collect and act on analog data from sensors. The **PowerPlex®** components communicate over CAN bus, which reduces the wiring time significantly. The **PowerPlex®** Configuration Software defines the I/O functionality of the modules. The configuration is then simply transferred to the installed modules via the CAN bus using a USB/CAN adapter.

Each Compact Module has 10 digital inputs and 10 power outputs and allows battery status monitoring. If the vehicle's batteries drop below a certain voltage, the loads will automatically be deactivated. A light flashes on the dashboard to alert the operator that the battery is low. The modules manage the connected electrical components including the medical equipment such as the heart defibrillator and suction apparatus, and also the mobile data computer and communications equipment. In addition, the **PowerPlex®** monitors and powers large light bars, the blue lights, the siren and a rechargeable torch.



**PowerPlex®** convinced London Ambulance with its modular concept and its robust system design, ensuring greatest possible flexibility.

London Ambulance configured many control functions to prevent the occurrence of inadvertent or illegal operation of the vehicle. These safeguards utilise inputs from the vehicle architecture such as status of the hand brake, the headlights and the ignition. For example, using the status of the handbrake as an input, the emergency rear red lights will not function unless the handbrake is on, as it is illegal to drive the vehicle while these lights are on. In addition a reset function was built into the vehicles. If any load trips, a red switch on the dashboard is illuminated, and by pressing this switch that tripped load can quickly be reset.



Space-saving installation of the **PowerPlex®** Compact Modules in the trunk of the vehicles.



More information?  
Just scan the  
QR-Code!

# Typically Englisch

## »Farmhouse Chicken«

*The recipe for Farmhouse Chicken is based on old English family recipes. This dish is traditionally prepared as a Sunday meal for the entire family.*



*Kulinarisches mit Tradition: Farmhouse Chicken*

### Directions

Cut the chicken into 8 pieces, wash and pat dry. Season with salt and pepper, turn in flour. Wash and peel the potatoes and cut into bite-size cubes. Peel the shallots and cut into wedges. Clean the mushrooms and cut into quarters.

Heat oil and butter in a casserole. Sear the chicken parts on all sides and remove. Sear potatoes, shallots and mushrooms one after the other and remove. Fry the bacon in a pan without oil until crispy.

Put the chicken pieces, the potatoes and the shallots in the casserole. Add salt, pepper, cayenne pepper and marjoram and pour in some chicken stock. Top with bacon and put casserole into hot oven, braise for 30 - 45 minutes at 200 °C. More chicken stock can be added if required.

**Enjoy!**

### Ingredients

- 1 chicken
- 500 g potatoes
- 250 g shallots
- 250 g fresh mushrooms
- 5 tbsp olive oil
- 5 tbsp butter
- 5 tbsp flour
- 6 slices of bacon
- 250 g chicken stock
- Salt and pepper, black cayenne pepper, marjoram

