E-T-A®
Circuit Protection & Control

E-T-A PowerPlex –
Bus System for Marine Applications

E-T-A
PowerPlex

Technology

E-T-A PowerPlex – Bus System for the Protection and Control of Electrical Installations in Recreational and Work Boats.

E-T-A PowerPlex is a comprehensive system which significantly reduces the need for conventional wiring, and combines reliability and user convenience, in easy-to-install modules purpose designed to meet the special requirements of watercraft – today and in the future.

E-T-A PowerPlex incorporates high-end power semi-conductors with integral protective elements for switching and protecting electrical loads. The system is free of any mechanical components which would be subject to wear or be susceptible to vibration, shock and other environmental influences. Unlike other methods of electrical protection, the semi-conductors provide integral current limitation thereby ensuring that the operating current cannot exceed predetermined limits, even in the event of a short circuit. This represents a major contribution to safety and reliability.

Concept

E-T-A PowerPlex consists of modules positioned as required around the vessel to facilitate the connection of loads, switches and sensors. The various components communicate with each other via a CAN bus to function as a single control system despite their different locations. As each PowerPlex module has its own micro processor, the installation does not require a central controller: each unit is able to work independently. By mounting the modules as close as possible to the loads, wiring and installation cost can be kept to a minimum.

E-T-A PowerPlex is an attractively styled system fit for the future. It offers a wealth of possibilities for the control of on-board electrical systems.

Configuration

E-T-A PowerPlex is designed for easy configuration by means of any MS Windows computer and the E-T-A software provided, together with a USB interface and standard adaptor leads. Any switch connected to a PowerPlex module can be configured to control any load output of any module. A choice of preset interlinking options is available to simplify the configuration process. PowerPlex offers a whole wealth of new possibilities, both for the control of on-board electrical systems and to provide added functionality for the user.

System Capability

In addition to its normal monitoring and switching duties, E-T-A PowerPlex can be used to perform a wide range of additional functions which otherwise could be achieved only with complex and costly electronic solutions. Examples include the dimming of lights, or the remote control of any load circuit by means of a suitable device. For timer controls, delay times within a wide range can be set and four analogue inputs with switching thresholds are available per module for the connection of sensors. In addition all the necessary control requirements for windscreen wipers can be catered for.

E-T-A PowerPlex – an open system

Protocol

E-T-A PowerPlex is an open system. Through defined and recorded CAN commands the system may be controlled by any suitable computer. Hardware and CAN commands are in conformance with the SAE J1939 standard. This allows the use of touch panels as a modern operating interface as well as the automation of certain functions by means of a central on-board computer.

Hardware

Presently the E-T-A PowerPlex is available as DC-Power Module or Panel Module. They can be combined with each other as required . While the DC Power Module can switch a total of 12 electrical loads with a total wattage of up to 2400 W, the Panel Module serves for connecting up to 32 switches with corresponding signalling LEDs for status indication. To enhance flexibility of the system, the DC Power Module has eight switching inputs while the Panel Module offers another six outputs. The modules have been optimally designed for installation in watercraft and to offer maximum flexibility on board. Modules are suitable for 12V or 24V DC electrical systems.

E-T-A PowerPlex offers you tailor-made solutions – whatever the requirements of your boat's electrical system.

Four Level
Protection Concept

Protection
E-T-A PowerPlex incorporates redundant protection as a special feature – termed Four Level Protection Concept - FLPC. This concept is based upon the interdependent functioning of four types of overload protection: software-controlled overcurrent protection with current measurement, hardware-controlled safety disconnection, intrinsic protection of power transistors and thermal protective elements with manual switching function.

Under normal operating conditions the software-controlled overcurrent protection can be relied upon for effective protection against electrical faults. However, recognising the safety-critical nature of certain on-board systems, two further levels of back-up protection have been provided.

In addition built-in electro-mechanical thermal protective elements will ensure limited operation of the system even in the event of a catastrophic failure. This is an important contribution to safety, particularly in a marine environment.

E-T-A PowerPlex is connected by means of shock and vibration-proof screwless spring-loaded terminals. The terminal area has strain relief for connecting cables and is protected against dripping water by a semi-translucent cover (IP22). The system meets relevant national and international standards for recreational and work boats.

PowerPlex
Software

Software

E-T-A PowerPlex is programmed with Windows compatible software providing easy configuration of all necessary on-board functions. Operation is similar to a data file manager and can therefore be used intuitively.

This software enables the linking of inputs and outputs, activation of dimmers as well as programming of timer functions. The current ratings for overcurrent protection of the output circuits and the time characteristics required are similarly programmed.

A specific test mode in this software is provided for controlling and testing a connected, configured system from the computer. In the test mode all CAN messages will be translated into plaintext, thus any activity on the CAN will be shown. A symbol is available for every input and output enabling the installed hardware to be checked in accordance with the specifications. In addition it is possible to simulate all input events with a mouse click to test the linkage of inputs and outputs. Voltage values at the analogue inputs and currents of the load outputs as well as the supply voltage at the module can also be verified.

Once configuration has been completed all data is saved and transferred to the installed system. The configuration will be stored in the system redundantly such that a replacement module will automatically self-configure in the event of a module failure, without a computer being required. An established configuration can at any time be reloaded, revised and re-transferred. For documentation purposes an automatic printout is available, holding all configuration data of the system as well as a wiring diagram.

Technical Data

General	
CAN-Bus	CAN 2.0B, SAE J1939 250kBit/s up to 30 modules per system
Supply Voltage	9…32 V DC
Protection class	IP22
Shock	IEC 68-2-27, Ea, 30 g, 11 ms
Vibration	IEC 68-2-6, Fc, 2…13.2 Hz, DA 2 mm 13.2…100 Hz, 0.7 g
Temperature range	-40…+70 °C (-40 …+158 °F)
	tested to DIN ISO 7637- Road Vehicles. Electrical disturbances from conduction and coupling (123 V, 4 Ohm, 100 ms)

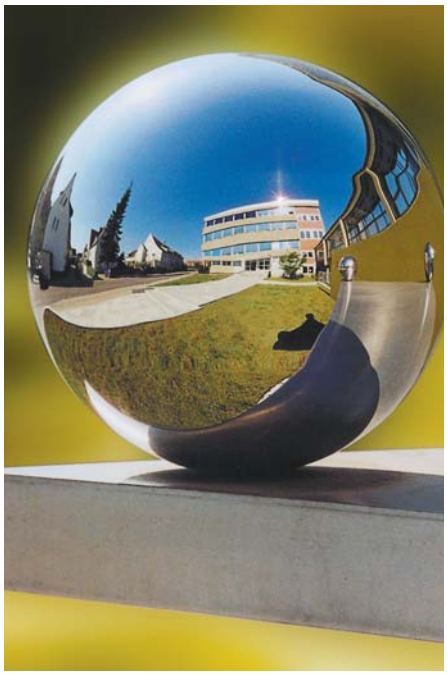
Meets the requirements of IEC 60533, Electrical and electronic installations in Ships – Electromagnetic compatibility

DC-Power Module	
Inputs switches, 4 analogue inputs 0…10 V	8 inputs for switches or momentary
Outputs	6 outputs with 8 A max. continuous current, FLPC 2 outputs with 25 A max. continuous current, FLPC 4 outputs with max. 1 A continuous current 8 status outputs with integral LED driver 102 A max. total current per module
Panel Module	
Inputs	32 inputs for switches or momentary switches, 4 analogue inputs 0…10 V
Outputs	2 outputs with 8 A max. continuous current, FLPC 4 outputs with max. 1 A continuous current 32 status outputs with integral LED driver

Features and Benefits

- simple configuration
- user convenience through Windows software and USB CAN converter
- well-proven CAN technology
- integral diagnostic and monitoring functions
- redundant protection - Four Level Protection Concept (FLPC)
- programmable overload protection
- wire break detection
- inputs for analogue sensors

E-T-A
Worldwide Service Network



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