



ELECTRICAL SYSTEM ELSY

... THOREB's intelligent E/E-Architecture-System for vehicles

THOREB's Video ELSY is a reliable system which enhances the performance and experience of the vehicles installed inside. Thoreb cooperates with leading coach builders all over the world and has produced thousands of buses with its system.

ELSY is not only a reliable electrical system – with its nodes and the vehicle computer it is possible to utilize information that is present in the system.

Events get logged constantly and can be analyzed at any time e.g. intermittent errors, like a loose contact, can be located and solved easily. This provides a potential basis for maintenance on demand. Buses nowadays get usually serviced depending on the number of kilometers driven. Instead logged data can be sent to a depot system via W-LAN or GPRS, where the latest operational data e.g. engine rpm, speed, pressures, temperatures, etc. will be compiled. Thereby any deviation from normal conditions can be identified due to other indicators than driven distance for planning the next service. Indications for a service of the brakes so might be the amount of decelerations done since the last maintenance.

THOREB

ELSY can be integrated in the bus easily with other systems and can replace a number of control units by using THOREB's vehicle computer and LCD screens. Setting the destination signs, controlling the bus climate system, making safety checks before driving, etc. are only some of the features available. The vehicle computer can be used to automatically switch to the rear view camera when reversing. During normal operation the driver can see the status of the doors. Fault conditions on any door sensor will alert the driver immediately just as warnings and error messages if an unexpected event occurs.

With ELSY the customer will not only get a vehicle with a reliable electrical system but combined with the software ELSYgraf, logical conditions can be designed by using graphic symbols instead of cryptic code. Just by drag & drop graphic symbols complex logical conditions can be build e.g. for the door control. Furthermore THOREB's ITradio System can send error reports automatically to the Traffic Management Interface (TMI).

Increases Efficiency and Intelligence

- Powerful tools included for designing the electrical system
- Complex conditions are easy to test and change
- One standardised cable harness can be used for different functionalities
- Possible to select multiple parameters for monitoring
- Fault tracing by using the application ThService
- Logged information makes it easy to find intermittent failures
- Reduced maintenance and lifecycle cost
- Our vehicle computer provides the driver and maintenance crew with optimal user interface
- The THOREB control panel enables optimal use of the dashboard space and functionality
- Replaces climate control units
- Controls route and destination signs
- Can be integrated with The THOREB Central System
- Digital map application for vehicle tracking
- Real time reports from the electrical system via 3G communication
- Maintenance can easily be planned based on statistics

Units included with ELSY

Nodes which are individually programmable

Vehicle Computer with various interfaces

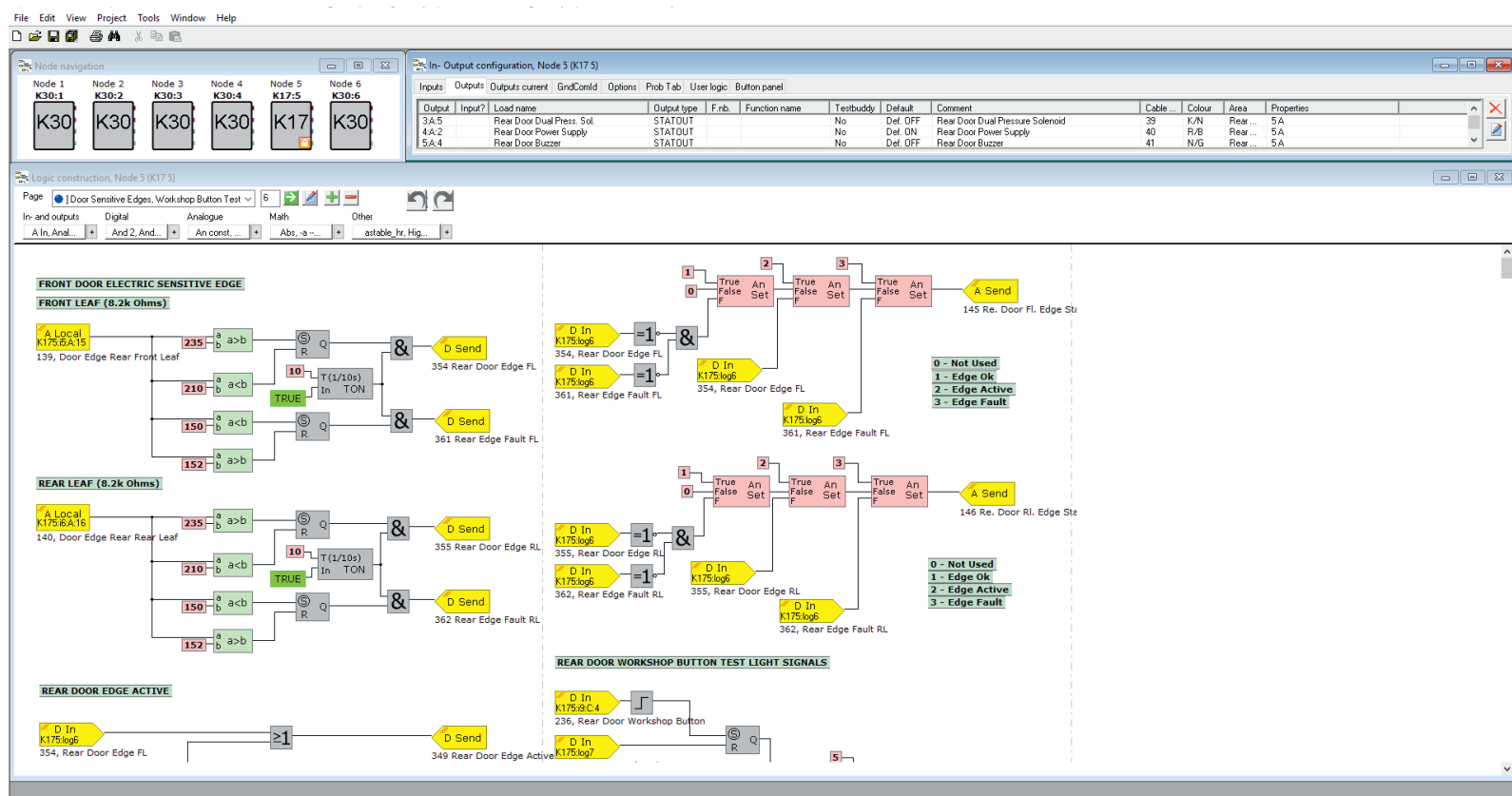
Driver Monitor for body and chassis functions that can also handle the basic needs in the dashboard and display warnings, diagnostics information etc.

Keyboard Controller that work independently of the nodes. It is part of the dashboard with can be connected up to 48 switches and 84 LEDs, along with a graphical LCD display.

ELSYgraf is THOREB's user-friendly software for body builders, used when designing the electrical system and the ELSY application software. No Pre-qualification in programming needed.

Canela+ is an application used for fault-tracing in the vehicles. It provides information about what is connected and where. Electrical drawings are so no longer needed.





Real-time Diagnostics

- For better service and maintenance, reduces waiting time and makes costsavings
- Optimizes driving performance and reduces fuel consumption
- Ensures planning reliability for maintenance, service and overhaul
- Improve driver performance and increase fuel efficiency
- With the thoreb control display unit at the front of the driver's, provide provides realtime feedback on
 - Acceleration
 - Retardation
 - Gear selection
 - Idling
 - Coasting
- Comparison of vehicles over time from the Thoreb Database

THOREB Alert System visualize data like

- Mileage
- Condition of the vehicles and the subsystems
- Maintenance schedule and intervalls
- Selective operating data
- Diagnosis both in realtime and as a downloadable file for further analysis
- Integration to VOITH and ZF Transmission



THOREB'S ELSY system aims at facilitating and enhancing the working environment for manufacturing staff, electricians, and drivers as well as service staff. At the same time the performance of the vehicle's electrical system is improved.

For the past 35 years we have acquired extensive experience providing bus and other vehicle builders with highly efficient electrical systems and driver interface designs. Today there are more than 25.000 vehicles globally with THOREB'S ELSY system.

Advantages

- ✓ Flexible and easy design
- ✓ Reduced installation time
- ✓ Fewer components needed than at similar systems
- ✓ Reduced weight
- ✓ Maintenance on demand
- ✓ Reduced environmental impact
- ✓ Remote diagnostics
- ✓ Supports a wide range of CAN protocols
- ✓ Supports door and climate controllers from different manufacturers
- ✓ Integration of THOREB door and climate controllers
- ✓ Integration with Thorebs real-time information system ITradio possible
- ✓ Less control units needed
- ✓ Customization can be achieved easily
- ✓ Powerful tools for designing the electrical system
- ✓ Can monitor VOITH gearboxes and has direct access to values from different engine builder
- ✓ Can be connected to a central system via 3G/4G to enable remote vehicle health diagnostics
- ✓ Reducing Maintenance and life cycle cost



AB Thoreb
Gruvgatan 37
SE-421 30 Västra Frölunda
Sweden

Phone: +46 31 734 39 00
Fax: +46 31 734 39 10
E-Mail: thoreb@thoreb.com

Copyright © AB Thoreb
All Rights Reserved
www.thoreb.com

