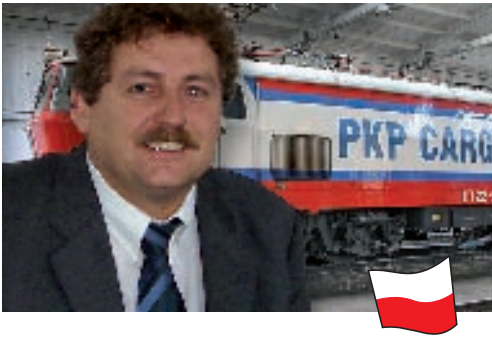




Retrofit ET 22-2000 – Poland

Modernizacja Loko- motyww elektrycznych





“Effective retrofit measures are the basis for the value retention of the vehicles. The diversity of DEUTA products fulfils the most diverse modernisation requirements. We would be pleased to make suggestions for project-specific solutions.”

Ulrich Angenendt, DEUTA

Innovation

Consultation

The project:

Modernisation of electrical locomotive ET 22-2000

The first ET 22 prototypes were built in 1969. After series production started in 1971, more than 1,183 locomotives were produced by 1989. PKP Cargo awarded the contract to modernise 53 type ET 22 locomotives which will be overhauled by the company ZNLE Zakłady Naprawcze Lokomotyw Elektrycznych S.A. in Gliwice. Electrical and mechanical components were replaced train by train at ZNLE.

The task:

Retrofit – the latest technology for the future

Multi-functional terminal, electrical travel system, analogue indicator, electronic counter or pulse generator: In the course of modernising the ET 22 locomotives, DEUTA is involved in the project with the most diverse products. Above all, high functionality combined with flexible integration options are stipulated here. Everything from just one experienced manufacturer, because this guarantees the optimal co-ordination of the products' performance features. Even the price-performance ratio is an important factor for PKP Cargo when making decisions about using DEUTA products.

Diversity creates a harmonious whole

The DEUTA multi-functional terminal MFT L11 will now be used in the driver's console. The compact structural shape and the high performance harmonize perfectly with the ambient conditions of the ET 22.

Moreover, the existing mechanical tachometric system had to be replaced. With the electrical EFA 15 travel system, ZNLE chose a proven incident recorder from the DEUTA product program. Functionality and a high integration level paired with a reasonable price-performance ratio convinced the Polish market. The round DEUTA ENG 13 analogue indicator and the electronic ZE 15 counter are new in the driver's console. The retrofit measures are complemented with the DEUTA DF 16/1 pulse generator: A compactly constructed, mostly maintenance-free pulse generator whose pulse part is designed with optoelectronic fork light barriers.

DEUTA – The partner for retrofit solutions

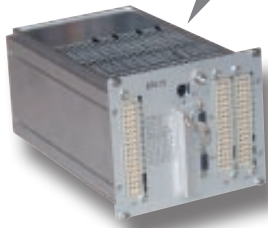
With more than 100 years of experience in equipping railway vehicles, DEUTA is the ideal partner for retrofit measures. Highly cost-efficient product-specific solutions are prepared for every modernisation task. Thus proven locomotives are made fit for the future through the latest DEUTA technology. The optimised life cycles of DEUTA products are the basis for the value retention of railway vehicles.



EFA 15 – Is an Electronic Travel Data System

- Records travel data in railway vehicles
- Optional MVB or CAN interfaces
- Numerous customer-specific adaptations possible
- Great functionality and a high integration level
- Favourable price-performance ratio
- The data are stored on a removable Compact Flash™ card
- Subdivided into a configurable short-time memory, operating and maintenance data memory
- Is read out and evaluated by the Deuta evaluation software for ADS 3 incident recorders

Travel data system
EFA 15



Electronic indicator
ENG 13



DF 16 – Pulse generator

- Compactly constructed and primarily maintenance-free pulse generator
- Pulse part with optoelectronic fork light barriers
- Up to four electronic pulse generator channels
- The channels are galvanically isolated from each other
- 3- to 6-pin device sockets for hard mechanical stress
- 14-pin bayonet plug according to MIL standard
- Separate supply of maximally two or four channels
- Version with permanently applied cable at the pulse generator is available upon request
- Selection of different drives available

ENG 13 – The Electronic Indicator

- Panel cutout Ø 131+ 0.5 mm
- Installation depth approx. 80 mm
- Weight approx. 0.6 kg
- Protection category front face IP53
- Internal illumination 2 x 2 W, BA7s

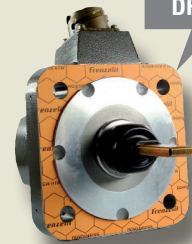
Multi-Functional
Terminal MFT L11



Electronic counter
ZE 15



Pulse generator
DF 16



MFT L11 – The extra class multi-functional terminal

- Software compatible with MFT 1, MFT 5, ...
- Form-fit-function compatible with MFT 1S1
- Obsolescence concept
- Single Board Computer with AMD Geode processor
- No moving parts, such as fans
- No battery necessary for setup and BIOS data
- Designed for Linux, Windows XPe™ and QNX™
- All interfaces for applications and service
- Environment-Controller for temperature management
 - ... Display and keyboard dimming
 - ... Watchdog (Boot / Hardware / Software)
 - ... Device keyboard
- Broad operating temperature range

ZE 15 – Electronic Counter

- For distance counting, as event counter, for quantity or for length registration
- Stationary or mobile possible
- Choice of display brightness in 16 stages
- Three counters
- Joint, galvanically isolated counting input
- Connection for the operating key to adjust the brightness and select the counter to be displayed
- An alarm output that is activated when exceeding or falling below a defined counter status
- RS 232 interface for connecting a service PC Flash memory





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