ComSWing PENET

System of remote transmission modems

- **For one or four channels of RS485 industrial interface in semi-duplex mode over metallic or fibre-optic cables**
- **Possibility to create line networks with several nodes with distance up to 15 km or 40 km according to modem type**
- **Two-way transmission of four binary signals for supervision of remote object**
- **Possibility of remote power supply of distant nodes**
- **Closed architecture for railway signalling**
- **Modular system, variability of modem types and power supply units**
- **High reliability and availability**
- **Low maintenance costs**
- **Easy installation**

GENERAL DESCRIPTION

The remote transmission modems system ComSWing PENET (further PENET) is a modular system for remote transmission of industrial signals with the RS485 interface in semi-duplex mode. In individual route sections (in addition to the main channels) four binary signals for remote object supervision or for other status information and commands are transmitted in both directions.

Transmission routes with PENET are designed primarily for data communication between station interlocking systems and their decentralised object controllers or for other remote control communications and diagnostics.

Feeding the remote nodes of transmission routes can be provided by superimposed voltage to the cable pair (in case of metallic cables) or by a special parallel metallic cable (in case of fibre optic route).

BASIC TECHNICAL DESCRIPTION

PENET consists of various panels with subracks for which the plug-in units of modems and power supply units (according to configuration of one or two parallel transmission routes) are designed.

The transmission routes with metallic cables are fitted with the central, end and intermediate modems integrating power supply sources including power supply of the remote nodes.

The transmission speed of user's channel RS485 is 62,5 kb/s (PENET network).

Transmission routes with optical fibres are fitted with modems for routes up to 15 km or modems with more powerful transmitters for 15 to 40 km routes. Feeding of optical modems is provided by plug-in power supply units integrating the local feeder, source of the remote power supply or source using the remote power supply. The transmission speed of each of four channels is individually adjustable from 1,2 kb/s to 115,2 kb/s.

The basic characteristics of routes with metallic cables are a high resistance against transmission interference and modest requirements as to the cable quality. For routes with fibre optic cables, the advantage is very small transport delay in transmission routes, independence on user data protocols and resistance against overvoltage impacts.

BASIC TECHNICAL PARAMETERS

Supply voltage	19,2 V to 34 V	
Remote supply voltage	96 V ± 3 %	
Input (for supply voltage 24 V)	max. 80 W ± 20 % (according to plug-in unit type)	
Interface of binary signals	4 parallel inputs	6 V to 24 V, 8 mA, U_{max} = 34 V
	4 parallel outputs	I_{max} = 100 mA, U_{max} = 34 V
Optical parameters	synchronous transmission	125 Mb/s, wavelength 1300 nm
	fibre optic cables	SM 9/125 optical fibres, connector type SC
	attenuation	max. 16 / 23 dB (route max. 40 km)
Line parameters (metallic cable)	duplex transmission	144 kb/s, ISDN Uk0 with modulation 2B1Q (ITU-T G.961)
	loop resistance	max. 1 kΩ
	attenuation	max. 37 to 50 dB at 80 kHz (route up to 15 km)
Insulation resistance	in the standard environment	min. 50 MΩ
	after test in humid	min. 7 MΩ
Electric strength	500 V	
Temperature range	–5 °C to +55 °C