

Central station coupling-module

Type REG-PE

▶ as 19" rack version



1. Application

Working as a coupling-device with control centers or with central units, the REG-PE operates with all tele-control protocols.

1.1 Features

- boots itself after power-on
- coordinates the telegram traffic between one or more substation units and WT- and/or modem-connections to central stations or substations
- checks automatically and continuously the memory of the device
- controls the watchdog
- parameters can be set online at any time
- adjustable to any remote control protocol
- multiple choices for connection such as fiber optics, RS 485, RS 232

1.2 Specification

The REG-PE board is equipped with a 32Bit CMOS - processor PPC860T and represents an independent computer, with an address-range of 64 GByte.

The CPU runs at a speed of 50-80 MHZ. The board has a maximum capacity of 2 RAM modules with 32MB in total memory as working memory.

Depending on the kind of the module the storage capacity for saving of special system device data as well as for the specific remote control protocol structure are up to 32MB flash memory.

All 16 hardware-timers are required for the TELE-DATA -real-time operating system TDXact. One timer is used for the system cycle. All of the processor-included UART -modules turn the 6 asynchronous V.24-interfaces. Each of these interfaces have their own baud rate timers.

Serial interface 0 is able to work from 600 Bd. up to 115200 Bd. and serial interface 1-3 from 60 Bd. up to 115200 Bd. The last timer is used for the protocol software.

For serial coupling in pulse-width-modulation (pulse-duration-m.) 100 Bd. up to 2400 Bd. are available. All interfaces can be used either in PWM- or in PCM (pulse-code-m.) -mode or as control lines for modem, so that up to 4 coupling partners can be served.

Despite the functions running by different software branches on REG-PE, there are general functions in order to protect the REG-PE module against malfunctions. These functions are realized by hardware supplements and by software parts.

1.3 Interfaces

The REG-PE module offers the following interfaces for communication with parametrizing PC and for connection with serial communication partners:

- 10/100Mbit Ethernet
- up to 6 serial interfaces
- 4 of those serial interface to PCM or PWM coupling partners
- 4 of those serial interfaces RS485
- up to 4 serial fiber optic interfaces (optional)
- all transmitters and receivers are galvanically isolated by optocouplers
- all drivers are able to work as V24

Interfaces for serial communication are connected via rackmount connector. They include control lines, data lines and the requested power supply potentials. With the help of short-circuit connectors you can adjust the inversion of the specific signals. The status of each channel is shown on the 3 LEDs on the front panel.

1.4 Socket Connections on the front

On the left hand side of front panel you see a 9pin-Sub-D-socket. This is used for 2 serial ports in order to supply e.g. parametrizing data. Via this connection you can easily parametrize REG-PE online at any time.

2. General Functions

Beside the functions, running by different software applications, there are main functions protecting against malfunctions of the device. These functions are realized by hardware-implementations and by software-routines:

2.1 Reset

There are four possibilities to trigger a reset on a REG-PE. A proper restart of REG-PE is guaranteed in each case:

- by pressing "RESET" on the front panel
- Watchdog runs up
- reconnection and return of power supply
- Reset by monitoring software module

2.2 Watchdog

Watchdog is a hardware-supplement to monitor the smooth process of the software. It consists of a timer that has to be triggered continuously by a background software program. Lack of retriggering leads to a hardware-reset. The correct status of watchdog is displayed by a red LED on the front panel near the Reset-button.

2.3 Contact positions for SCCs and power

Pin	d	b	z
2	FREMD-P	FREMD-N	PROZA
4	COM4-GND	485-4-N-T	485-4-P-T
6	COM4-CTS	485-N-4	COM4-RTS
8	COM4-RXD	485-P-4	COM4-TXD
10	COM3-GND	485-3-N-T	485-3-P-T
12	COM3-CTS	485-N-3	COM3-RTS
14	COM3-RXD	485-P-3	COM3-TXD
16	COM2-GND	485-2-N-T	485-2-P-T
18	COM2-CTS	485-N-2	COM2-RTS
20	COM2-RXD	485-P-2	COM2-TXD
22	COM1-GND	485-1-N-T	485-1-P-T
24	COM1-CTS	485-N-1	COM1-RTS
26	COM1-RXD	485-P-1	COM1-TXD
28	PE	PE	PE
30	GND	GND	GND
32	VCC	VCC	VCC

3. Technical Data

Processor	MPC860T
Processor Technology	CMOS
Memory	64MB SDRAM
Operating system	realtime-UNIX

Serial Interfaces	max. 6
Input-resistance	1000 Ohm
Output-resistance	120 Ohm
Input voltage	+ - 3...12 V

Power supply TK860 + 5V +/-10% 0,6A max.

Reference conditions during operation in a 19" rack

temperature:	- 20..+55C
relative humidity:	max. 85% at 25°C
Storage:	
temperature:	-25..+65C
relative humidity:	max. 80% at 25°C

3.1 Parametrizing TK860

A generated file is transferred via serial interface from a standard PC into REG-PE. Data is kept in flash memory.

3.2 Applied rules and standards

- IEC 61010-1 / EN61010-1
- IEC 60255-22-1 / EN 60255-22-1
- IEC 60529 / EN 60529
- ICE 60068-1 / EN 60068-1
- ICE 61000-6-2 / EN 61000-6-2
- ICE 61000-6-4 / EN 61000-6-4

3.3 Mechanical construction

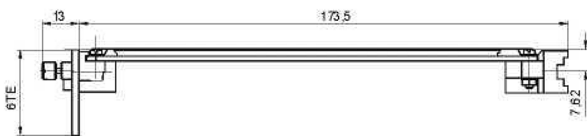
Front Panel ALU, RAL 7035
 height, width 3U, 6T (129 mm, 71 mm)
 weight < 0,4 kg

Protection class

plug in device IP 00
 terminal block IP 00
 according to DIN 41494 Part 5 / DIN 41612

Mounting

connector block



Picture 1: Dimensions plug-in module

3.4 Data programming cable

Cable has to be shielded and may not be longer than 1.5m.

PC-Sub-D-connector 9 pin	Meaning	REG-PE Sub-D-connector 9 pin
1	n.a.	-
2	TXD SMC1	3
3	RXD SMC1	2
4	n.a.	-
5	GND	5
6	n.a.	-
7	TXD SMC2	-
8	RXD SMC2	-
9	n.a.	-

3.5 Housing

Terminal screws with self-locking protection; clip on connector block

3.6 Operating modes

The telecontrol board REG-PE has got no jumpers on board. In order to switch between the operating modes RS485 and RS232 (fiber-optic mode is done via RS232 mode and additional piggy back module) a software parameter has to be set accordingly.

4. Electric security

Protection class I
 Grade of pollution 2
 Overvoltage category, rated isolation voltage

Name	Overvoltage	max. Overvoltage
Serial interfaces	II	50 V front
Serial interfaces	II	350 V back

Transient voltage strength 5 kV, 1,2/50 ms, 0,5 Ws

Immunity

Electrostatic discharge Airload 8 kV
 Contactload 4 kV
 Electrostatic discharge 80 MHz...1000 MHz 10 V/m
 900 MHz ± 5 MHz 10 V/m pulsemodulated

Rapid transient disturbance quantities (Bursts)

Power supply AC 230 V: 2 kV
 Data signal lines 1 kV

Contacted RF-disturbancefactors

0,15 MHz...80 MHz
 $U_{eff} = 10 V$
50 Hz- magnetic field 30 A / m
Disturbance emission Group 1 limit class A

4.1 RS485-Processing

In order to terminate the RS485-bus you should use an external termination resistor.

4.2 Fiber-optic connectors

All connectors have SMA/ST-standard-size. The wavelength is at 660/850nm and is ready for glass and plastic fiber-optics.

Jumpersettings fiber-optic board

Jumper	meaning
X5-1	receiver invert
X6-1	transmitter invert

4.3 Commissioning of the board

For commissioning purposes a quick guide and an elaborately user manual with parameterizing guide is coming with the board and also downloadable on our home page. The parameterizing is done via web browser or a Windows-based application.

4.4 Fields of application

The telecontrol board REG-PE processes the following telecontrol protocols together with eberle devices:

- IEC 60870-5-101
- IEC 60870-5-103
- IEC 60870-5-104
- IEC 61850
- DNP3.0
- MODBUS

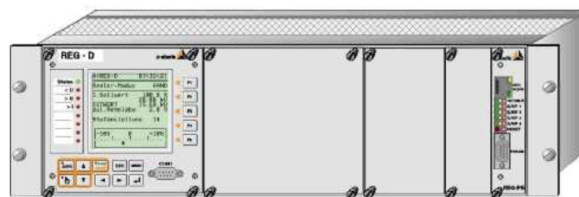
- ELAN-Extension (CSE, COM Server Ethernet): Extension of ELAN via serial port of REG-PED over Ethernet in order to connect to another REG-PE(D) via Ethernet in order to achieve wide area ELAN. Fully equipped REG-PED provided.
- NTP to DCF Time Synch Feature
- Other protocols on demand

The telecontrol connection can be made via RS232, RS485 and fiber optics.

The parameterizing is done via web browser or a Windows-based application, which is divided in two main sections:

- common part where only baud rate and device address have to be entered
- advanced part where specialist may adjust specifics.

This implies timeouts etc. and other protocol specifics as well as modification possibilities of the telecontrol profiles.



Example picture of mounting in 19"-rack

5. Ordering details

Please note:

- Only one code with the same capital letter is possible
- The code can be omitted when the capital letter is followed by zero only

FEATURE	CODE
Protocol-Interface-Card 6TE, 3HE, 6 ser. Interfaces, 10/100Mbit Ethernet	REG-PE
Design	
19" plug-in card (standard)	B1
Fiber optics (ST)	B2
Further connection types on demand!	B99
Connection Types	
RJ45 (standard)	-
Fiber optics (ST)	V12
Fiber optics (LC)	V14
Further connection types on demand!	
Type of telecontrol protocol	
IEC103 (typical protocol templates available for all SCADA manufacturers)	Z90
IEC104	Z92
IEC61850	Z31
MODBUS RTU	Z23
COM-Server (some protocols can concurrently run with it)	Z40
You're welcome to ask for other protocols!	Z99
Application Type	
For use with REG-D	L1
For use with combinations of REG-D/DA, REG-DP/DPA, EOR-D, PQI-D	L9
For use with non-a-eberle devices as e.g. COM-Server	L99
Operation Manual	
German	G1
English	G2
Russian	G3
Other languages on demand!	G99
Further fields of application	
The board can be used as protocol converter or coupling module for RTUs.	

Notes

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