POWER FOR RELIABILITY

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KOP Battery Protection Device
KOPPROTTERM
User interface manual
Supports KOP-PROT V4,V5

Version 3.10

Note: Prerelease version – not for customers - for internal use only

Piktronik d.o.o.
Cesta k Tamu 17
2000 Maribor
Slovenia
www.piktronik.com
info@piktronik.com

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KOPPROTTERM

1.Introduction

KOPPROTTERM is user interface, designed for communication with KOP-PROT diagnostic board via serial interface. The software tool can be used for:

- Battery state monitoring, charger monitoring
- Parameter management (editing, uploading, downloading, saving and loading)

The application is a MS Windows program, which runs under Windows 98, Windows 2000, Windows XP and Windows 7.

2.Accessing the features and communication port settings

Entering the PIN

User interface enables access to diagnostics by default. To be able to change settings of the KOP-PROT, user is prompted for PIN number, which can be found in “Help\About” menu or accessed by shortcut F2.

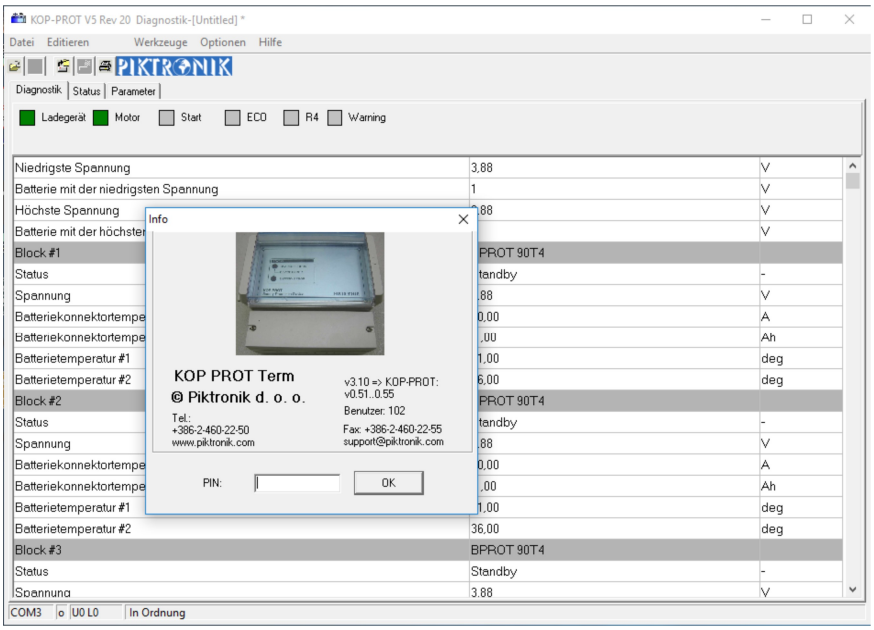

Fig 1: Info about the application with PIN number prompt

Current access level is shown in status bar at the bottom in the third frame with number of the user (U), followed by the access level (L).

Communication

Connect KOP-USB to KOP-PROT using interface connector and then start KOPPROTTERM.

The communication between application and KOP-PROT can be established via serial port. The appropriate serial port can be selected from list of available ports in menu „Optionen". When the application recognizes the device KOP-PROT, the text in status bar on bottom changes to "In ordnung". If there is no reply from the device, the text is changed to "KOP-PROT meldet sich nicht".

Troubleshooting: No reply from KOP-TERM:

- Check if the KOP-TERM is powered to 12V (display shows values).
- Check if KOP-USB interface is connected to both KOP-TERM and PC
- Check if corresponding communication port is selected in KOPPROTTERM (The port can be checked in "Control desk/System/Hardware/Device Manager/Ports"

3.User interface layout description

The user interface screen consists of title, menu bar, tool bar consisting of icons representing most used functions and diagnostic „Diagnostik" page. When parameters are loaded, or when the device is connected, the version of the parameters, or device is shown on the title bar together with the file name of the loaded parameters. The version of the parameters or device is shown in the title (V3,V4 and latest V5).

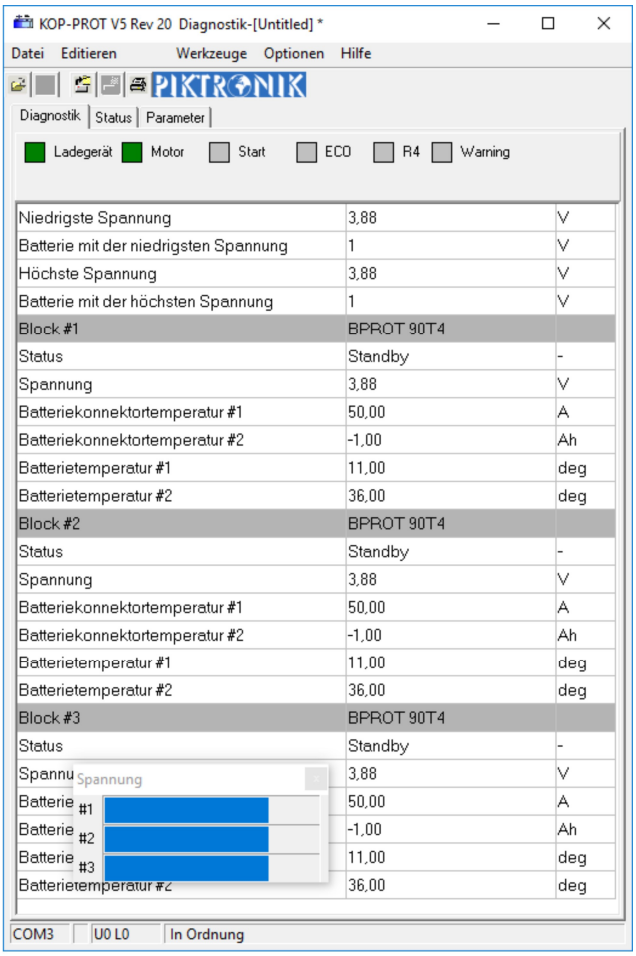

Fig 2: User interface diagnostic page

Diagnostic page

The top row represents the state of operation in the KOP-PROT (State of the relay outputs "Ladegerät", "Motor", state of the "Start" input, state of „ECO" and relay R4.

First line in the table shows the lowest voltage („Niedrigste Spannung"), the device number is shown in the next row. Third line shows the highest voltage ("Höchste Spannung"), the device number with highest voltage is shown in the next row.

The data for each device are followed in next rows, showing:

- device number and type,
- its status,
- voltage per cell. *1)
- When BPROT90T4 is connected Batteriekonnektortemperatur #1 is shown
- When BPROT90T4 is connected Batteriekonnektortemperatur #2 is shown ,
- Batterietemperatur #1, *2)
- and Batterietemperatur #2, *2).

By clicking on the variable, the „popup“ frame shows current value of all variables in graphical form for comparison.

*1) In KOP-PROT version V4, and V5 is voltage calculated depending on the number of cells parameter.

*2) When BPROT is used, the battery temperatures are shown as #1 and #2.

When the temperature sensor is not available the value of -- degrees is shown.

Temperature sensor KTY81-210.

When the temperature is out of charger temperature range, relay is switched off. When the temperautre range is out of discharger temperature range Motor relay is switched off. The temperature is switched back again when temperature range is within both ranges.

Note: If one temperature sensor is disconnected the other is used. When both are not used, the system turns off. If one temperature sensor of the battery wiring PCB is disconnected the other is used end ECO is turned ON. When both are not used, the system turns off.

Status

Status page is automatically loaded from the KOP-PROT when parameters are loaded. On the top is the serial number of the controller, followed with the number of starts and the operating time in hours.
Next section consists of error counters. For each error is shown how many times the error has occurred.
The last section shows the history of recent errors. Each entry consists of Error name and the device which caused it. How many times same error occurred is shown and the operating time when first time occurred together with the number of starts.

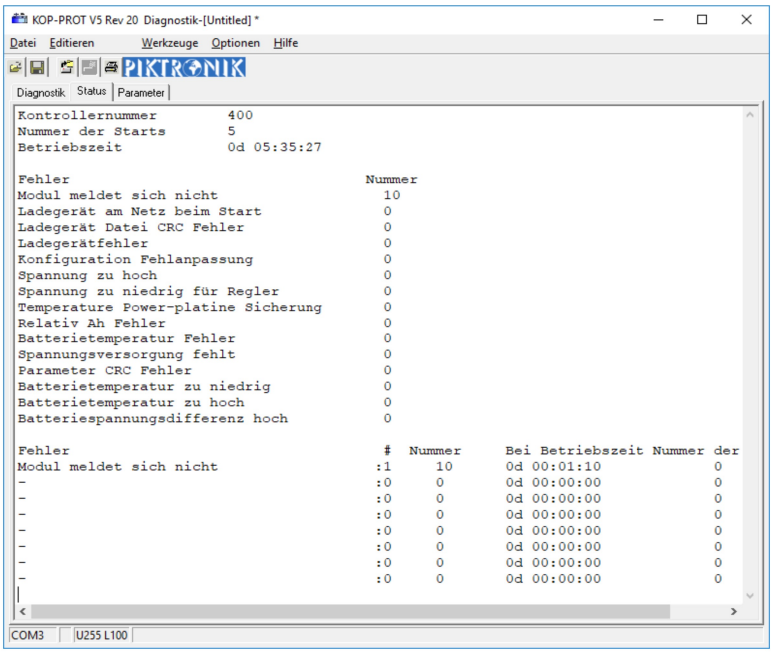

Fig 3: Status page

Parameter page

The parameter page is shown when parameters are loaded from computer or when reading the parameters from the connected KOP-PROT is issued.

The changing of the parameters is allowed only when correct PIN code is entered. Each parameter change must be confirmed by ENTER.

Note: After changing the parameters, the parameters must be written to the device by issuing write command in order to be applied in the KOP-PROT. The device is automatically restarted.

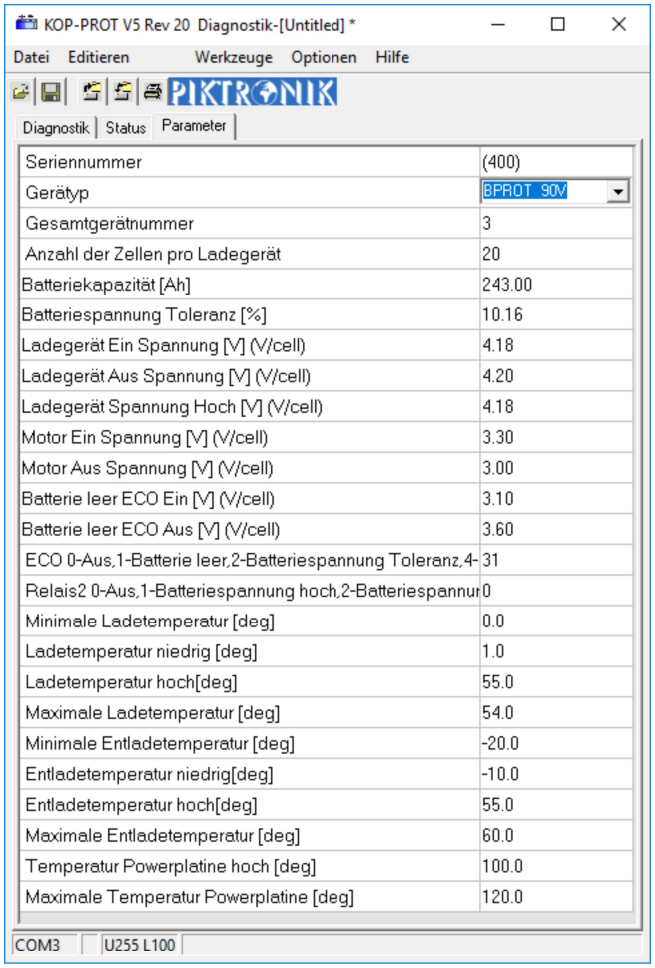

Fig 4: The parameter page

Open [CTRL-O] 

The parameters can be loaded from the file by using toolbar or menu „Datei\Offen“

Save [CTRL-W] 

The parameters can saved to the file by using toolbar or menu „Datei\Speichern“..

Read from the device [CTRL-R] 

The parameters are read from the device by using the tool bar icon or using menu „Werkzeuge\Lese die Parameter und Daten aus dem KOP-PROT”

When parameters are loaded from the file or from the KOP-PROT, the “Parameter page” is shown consisting of name of the each parameter, followed by unit and finally its value. The parameters are can be changed by entering proper user code, in the “Hilfe/Info” menu.

Write to the device [CTRL-W]

The user parameters can be sent to controller via toolbar icon or using menu “Werkzeuge\Schreibe die Parameter in den KOP-PROT”.

Note: To apply the values of the parameters to KOP-PROT, they must be written to the device.

Print [CTRL-P]

Current page (Diagnostics or Parameter) can be printed out using toolbar icon, using menu “Datei\Print” or shortcut.

Copy All [CTRL-C]

The data shown on current page (Diagnostics or Parameter) can be exported in text form to clipboard by using menu “Editieren\Kopiere Alles” or by using shortcut “CTRL-C”.

The list of the parameters

The parameters depend on the KOP-PROT version. The latest version is V5, which supports devices BPROT90T4. Also V4 with BPROT90T is supported.

Name	Default value	Description
Seriennummer	(400)	Serial number of the KOP-PROT
Gerätyp	BPROT 90V	The device type
Gesamtgerätnummer	6	The number of devices connected to the KOP-PROT
Anzahl der Zellen pro Ladegerät	20	Number of cells of the device
Batteriekapazität [Ah]	243	Nominal battery capacity
Batteriespannung Toleranz [%]	10,16	Maximal voltage tolerance of the blocks
Ladegerät Ein Spannung [V] (V/cell)	4,18	The voltage when the charger is enabled again
Ladegerät Aus Spannung [V] (V/cell)	4,20	Maximal voltage which switches off the charger
Ladegerät Spannung Hoch [V] (V/cell)	4,18	High charging voltage
Motor Ein Spannung [V] (V/cell)	3,3	Voltage when the motor is switched back on again
Motor Aus Spannung [V] (V/cell)	3,0	Voltage when the motor is switched off
Batterie leer ECO Ein [V] (V/cell)	3,1	Minimal voltage to turn ON ECO

Batterie leer ECO Aus [V] (V/cell)	3,6	Voltage when ECO is resumed back to OFF
ECO 0-Aus,1-Batterie leer,2-Batteriespannung Toler	31	ECO switch function *1)
Relais4 0-Aus,1-Batteriespannung hoch,2-Batteriesp	0	Relay function *2)
Minimale Ladetemperatur [deg]	0	Minimal charging temperature
Ladetemperatur niedrig [deg]	1	Low charging temperature
Ladetemperatur hoch[deg]	54	High charging temperature
Maximale Ladetemperatur [deg]	55	Maximal allowed temperature for charging
Minimale Entladetemperatur [deg]	-20	Minimal temperature for discharging
Entladetemperatur niedrig[deg]	-10	Low temperature for discharging – turns ECO on below
Entladetemperatur hoch[deg]	55	Discharging temperature high.
Maximale Entladetemperatur [deg]	60	Maximal discharging temperature
Temperatur Powerplatine hoch [deg]	100	High temperature for power PCB
Maximale Temperatur Powerplatine [deg]	120	Maximum power PCB temperature

Note: *1) The value is a sum of selected settings:

- 0-Aus/ Off,
- 1-Batterie leer / Battery empty,
- 2-Batteriespannung Toleranz / Battery voltage tolerance,
- 4-Batterie temperatur hoch bei Entladung / Battery temperature high at discharging,
- 8-Batterie temperatur niedrig bei Entladung / Battery temperature low at discharging,
- 16-Temperatur Powerplatinesicherung / High temperature for power PCB

Note: *2) The value is a sum of selected settings:

- 0-Aus / Off,
- 1-Batteriespannung hoch / Battery voltage high,
- 2-Batteriespannung Toleranz / Battery voltage tolerance,
- 4-Batterie temperatur hoch bei Ladung / Battery temperature high at charging,
- 8-Batterie temperatur niedrig bei Ladung / Battery temperature low at charging,
- 16-Start

Error messages and error codes

Error message is composed of the number of the device with error followed by the description of the error.

Er17	**Ladegerät meldet sich nicht** **No data from device**	The device is not responding. Check the cable connection and if the device is powered on. At startup takes up to 15 seconds to recognize the device.
Er18	**Ladegerät am Netz beim Start** **Charger powered**	The charger is connected to power supply, and Start is switched on. Check if charger cable is connected to power supply.
Er19	**Ladegerät Datei CRC Fehler** **Charger data CRC**	Error at the communication between the charger and KOP-PROT.
Er21	**Charger Conf. Error**	More detected devices than setting in the parameters
Er33	**Spannung zu hoch** **Voltage too high**	The voltage is too high. Check the settings in KOP-PROT and charger.
Er34	**Spannung zu niedrig** **Voltage too low**	The battery voltage is too low for the controller. The battery is empty. Charge the batteries
Er35	**Temperature Power-platine Sicherung** **Batt. temp.PCB Error**	The battery PCB sensor shows too high temperature. Check value or if connected.
Er37	**Batterietemperatur Fehler** **Batt. Temp too low / high**	Temperature of the battery is out of range or sensors not connected. Check the temperature sensors.
Er38	**Batteriespannungsdifferenz hoch** **Batt. volt. tolerance**	The voltage differences between the blocks are too high
Er49	**Spannungsversorgung fehlt** **Device power fail**	12 V supply voltage is too low. Check the board battery supply to KOP-PROT.
Er50	**Device internal Err** **Parameter CRC Fehler**	The parameter checksum is invalid. The error due to data transfer. Retry writing the parameters to the controller. Wrong software version for parameter setting.

Warning messages

At warning ECO switch is turned ON until warning is present and START is ON. Some of the warnings are enabled by the parameter.

Entladetemperatur niedrig	The temperature at discharging is too low. ECO can be turned ON.
Entladetemperatur hoch	The temperature while discharging is too high. ECO can be turned ON
Ladetemperatur niedrig	The temperature is low while charging. RE4 could be turned ON.
Ladetemperatur hoch	The temperature is high while charging. RE4 could be turned ON.
Temperature Powerplatine hoch	The battery voltage is too low for the controller. The battery is empty. Charge the batteries
Batteriespannung Toleranz	The difference between battery block voltages are high, ECO can be turned ON.
Batterie leer ECO Ein	The battery block voltage is low. ECO can be turned ON.
Batteriespannung Hoch	The battery voltage is high. RE4 could be turned ON.