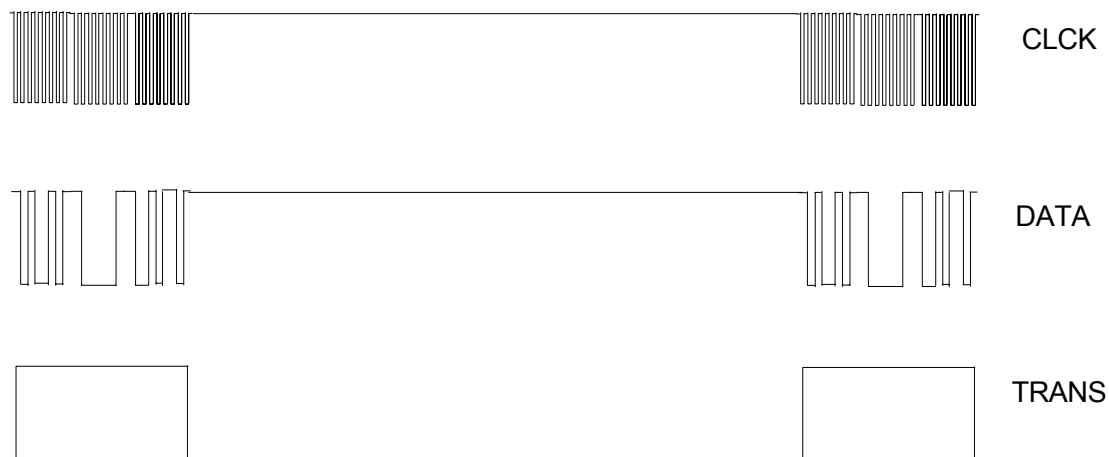


ELECTRONIC POSITION SWITCH TYPE ERC-D

The **electronic position switch type ERC-D** approved e.g. for heavy duty applications is fitted into a plastic snap-in casing (Phoenix) with clamping for DIN rail 35 mm width and is operating as evaluation electronics for the absolute encoder type AMD. All signal inputs are isolated from the input wires by means of optocouplers. The absolute value provided by the absolute encoder (in cycles < 2 ms) will be registered and compared with **6 programmable switching ranges consisting of one switching-on and one switching-off position each**. This controls the **6 change-over contacts of relays**. Furthermore an **error relay** is available and its contact opens on failures.

The unit can be set to Singleturn operation (12 bit) and to Multiturn operation (1-12 bit Multiturn + 12 bit Singleturn). **Programming** of the electronic position switch and setting of the switching ranges are effected by means of a PC (Laptop) with **serial interface (RS232)**.



Pulse diagram of input signals

The 24-bit data word (DATA) will be stored into the input register with the time signal (CLOCK) of the encoder. The transmission signal (TRANS) will then give the start for input signal processing as well as for comparison with the programmed values for the switching points. The relays for the switching outputs will be controlled accordingly.

If one or more wires connecting the encoder with the electronic position switch are interrupted or an error is generated by the encoder, the error relay will open and a LED indicates the error.

ERC-D_e_20070103

Mechanical Data

Plastic snap-in housing (Phoenix) with clamping for DIN rail 35 mm width

height	120 mm
depth	90 mm
width	140 mm

Electrical Data

Supply voltage 12V up to 30 V (DC)

Inputs: (optocoupler)

DATA	24 bit data word	low = active
DATAG	24 bit data word	inverted
CLCK	24 pulses/data cycle	low = active
CLCKG	24 pulses/data cycle	inverted
TRANS	transmission signal	low = active
TRANSG	transmission signal	inverted
ERR	error indication	low = active
ERRG	error indication	inverted

Signal amplitude: 5V up to 30V

Input frequency: 0 - 100 kHz

Outputs:

Switching points	6 isolated Relay Contacts (change-over) 250 V, 500 mA, 30 W
Error display decoupled	1 isolated Reed-Relay Contact (change-over) 200 V, 500 mA, 10 W
ERROUT	error indication low = active
ERROUTG	error indication inverted
	output voltage approx. as supply voltage

Operation:

Singleturn mode	12 bit
Multiturn mode	1 bit... 12 bit (Multiturn, programmable) + 12 bit (Singleturn)

Serial Interface: RS232, 9600 Baud, 8 bit, 1 Stopbit

Connection Diagram

Plug A and B

Clamp No.	Designation	Description	Function
A1/B1	+(12..30)V	Operating voltage	supply
A2/B2	0V	GND	supply
A3/B3	CLCK	24 Clock pulses (LOW = active)	Input + Output
A4/B4	CLCKG/GND	24 Clock pulses inverted/GND	Input + Output
A5/B5	DATA	24 bit-data word (LOW = active)	Input + Output
A6/B6	DATAG/GND	24 bit-data word inverted/GND	Input + Output
A7/B7	TRANS	Transmission control (LOW = active)	Input + Output
A8/B8	TRANSG/GND	Transmission control (inverted/GND)	Input + Output
A9	ERR	Error (LOW = active)	Input
A10	ERRG	Error inverted	Input
B9	ERROUT	Error (LOW = active)	Output
B10	ERROUTG	Error inverted	Output
A11/B11			Connection A-B
A12/B12			Connection A-B
A13/B13	Z	Setting zero point	Connection A-B
A14/B14	ZG	Setting zero point	Connection A-B

Plug C and D

Clamp No.	Designation	Description	Function
C1	Relay 0	N/C	Change-over relay
C2		Common Contact	
C3		N/O	
C4	Relay 1	N/C	Change-over relay
C5		Common Contact	
C6		N/O	
C7	Relay 2	N/C	Change-over relay
C8		Common Contact	
C9		N/O	
D1	Relay 3	N/C	Change-over relay
D2		Common Contact	
D3		N/O	
D4	Relay 4	N/C	Change-over relay
D5		Common Contact	
D6		N/O	
D7	Relay 5	N/C	Change-over relay
D8		Common Contact	
D9		N/O	
	Error Relay	Contact A	Opens on error
		Contact B	

Plug PC1

2	RX	RS232-serial Interface data input	
3	TX	RS232-serial Interface data output	
5	GND	RS232-serial Interface GND	

SOFTWARE FOR ELECTRONIC POSITION SWITCH TYPE ERC-D

With this software the 6 switching ranges of the electronic position switch can be set by means of a PC (Laptop). Windows 3.1 or higher must be available. The operating is effected by Mouse or Keyboard, the values have to be set by a keyboard.

For programming there are 4 possibilities:

1. Input of the switch position values into the corresponding fields according to the input display 1 and setting of these values by field „Programming“.
 Application: e.g. commissioning
2. Read-out of the values stored in the electronic position switch by using field „Read“, change the appeared values in the corresponding fields of the input display and store the changed values into the electronic position switch by field „Programming“.
 Application: e.g. for Checks or Changes
3. Data input of the values from disc or harddisc, change the corresponding values and set the electronic position switch by field „Programming“.
 Application: e.g. updating of earlier settings
4. Drag and Drop the current position into the fields for switching-on and switching-off positions by the left mouse button.

The screenshot shows the ERC-Pro software interface. At the top, it displays 'V 2.0' and 'ERC V 2'. The main area is divided into several sections:

- Current pos.:** A field showing '0' mm.
- Switching pos. mm:** A table with 6 rows (R5 to R0) and 4 columns. The first column contains 'ON' buttons, the second and third columns contain numerical values, and the fourth column contains 'OFF' buttons.
- Mode:** A dropdown menu set to 'Multiturn'.
- Multiturn:** A field set to '3'.
- Hysteresis:** A field set to '1'.
- Count direction:** A dropdown menu set to 'Right'.
- Unity:** A dropdown menu set to 'mm'.
- Conversion factor:** A field set to '1'.
- Identification:** A field set to 'huebner'.
- Last edit:** A field set to '10.06.98'.

At the bottom, there are two large yellow buttons: 'Read' and 'Programming'. Labels with arrows point to various parts of the interface:

- 'Display switching ranges' points to the vertical bar chart on the left.
- 'Switching on positions' points to the 'ON' buttons in the table.
- 'Switching off positions' points to the 'OFF' buttons in the table.
- 'General data input' points to the configuration parameters on the right.

Display 1 for programming of the electronic position switch

Following parameters can be entered into the programmable position switch and read out again:

- Selection Singleturn/Multiturn
- Multiturn bit number in multiturn operation
- Switching range input / can be converted
- Value of hysteresis
- Counting direction
- Dimensional unity
- Identification
- Last edit (automatic setting)
- Conversion factor

Selection Single/Multiturn **CTRL M** (Display 1, general data input)

This selection decides whether in singleturn mode the 6 switching positions can be set only within the range of one revolution of the absolute encoder or in multiturn mode also within the range of 4096 revolutions. For operation with a singleturn encoder the selection is on principle to be set to „Singleturn“. But when connecting a multiturn absolute encoder the selection of „Multiturn“ is permissible. The electronic control of the programmable position switch is in this case operating in the same way as with a singleturn unit. Multiturn/Singleturn mode is selected by input field „Mode“ by double click

Multiturn bit number in multiturn operation **CTRL T** (Display 1, general data input)

In multiturn operation the multiturn bit number can be set in the range of 1-12 bit by double click in field „Multiturn“ or by PGUP/PGDOWN. The bit number has to be the same or smaller than the connected absolute encoder.

Switching range input **TAB,CTRL S,** (Display 1, switching position input)

6 different switching ranges can be set in any sequence. The values have to be entered into the fields by a keyboard. Furthermore it is possible to place the switching range positions and length in the display by drag and drop with the right mouse button or with the left mouse button drag and drop the value in field „current position“ into the fields for the corresponding switching-on and switching-off positions. By setting the start value and the end value it is possible to have a matching of the graphics to the switching ranges (zoom effect). The switching range can be inverted by double click with the left mouse button on the fields „ON“ and „OFF“ or with PGUP/PGDOWN.

Value of hysteresis **CTRL H** (Display 1, general data input)

For the hysteresis you can select a value of $0 < n < 255$. This determines the relay switching-off, i.e. n increments lower than the set switching positions.

Counting direction **CTRL R** (Display 1, general data input)

The counting direction of the ERC can be set by double click in this field with the left mouse button or with PGUP/PGDOWN.

Dimensional unity **CTRL E** (Display 1, general data input)

With this field you have the possibility to call up following unities by double click with the left mouse button: mm, cm, m and degree

This input will not influence the calculation of the values. An exception is the unity „degree“ which can only be used in singleturn mode and will set the end value of the position graphics to 359° and simultaneously the corresponding conversion factor will appear.

Identification

CTRL K (Display 1, general data input)

This gives the possibility to enter any identification code with a max. length of 8 characters.

Last edit

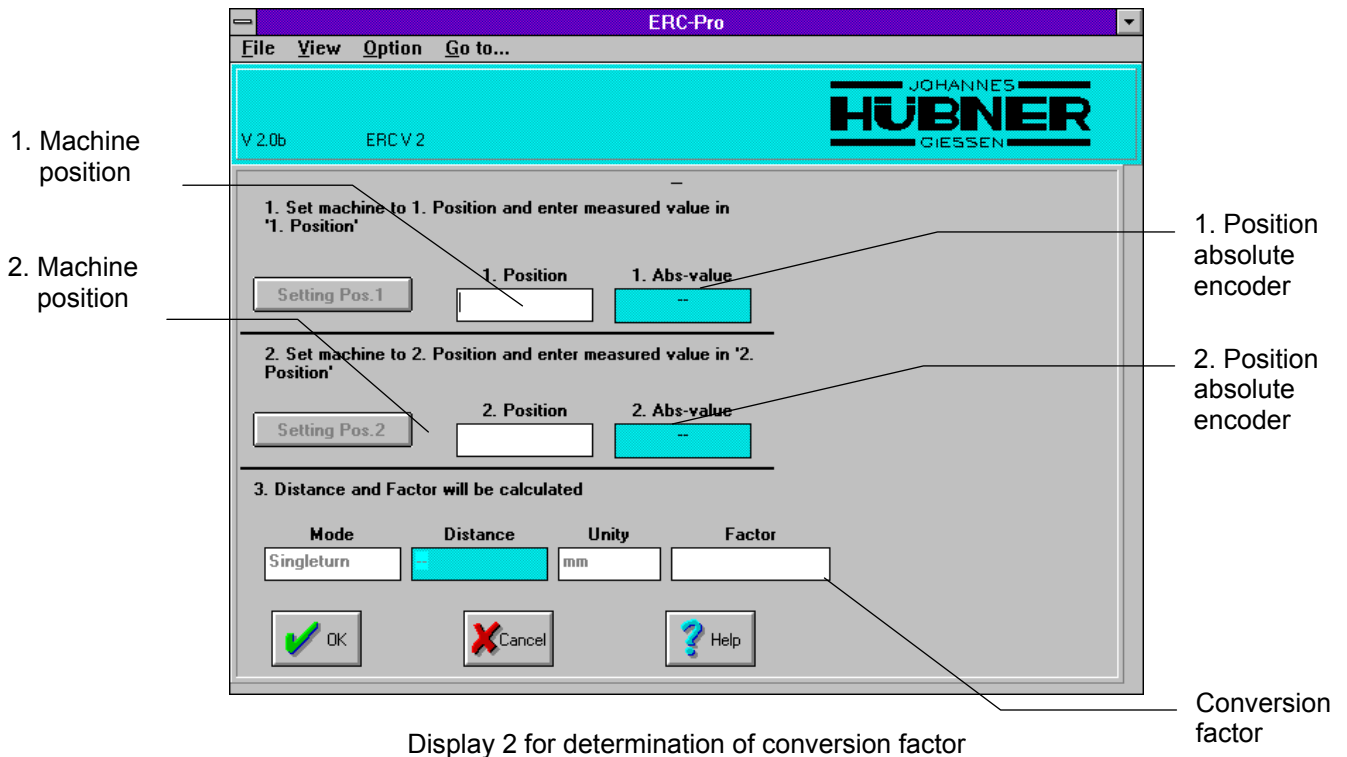
CTRL D (Display 1, general data input)

By actuating field „Programming“ the date will be read into this field. With function „Read“ the date of the last programming will appear.

Conversion factor

CTRL F (Display 1, general data input + Display 2)

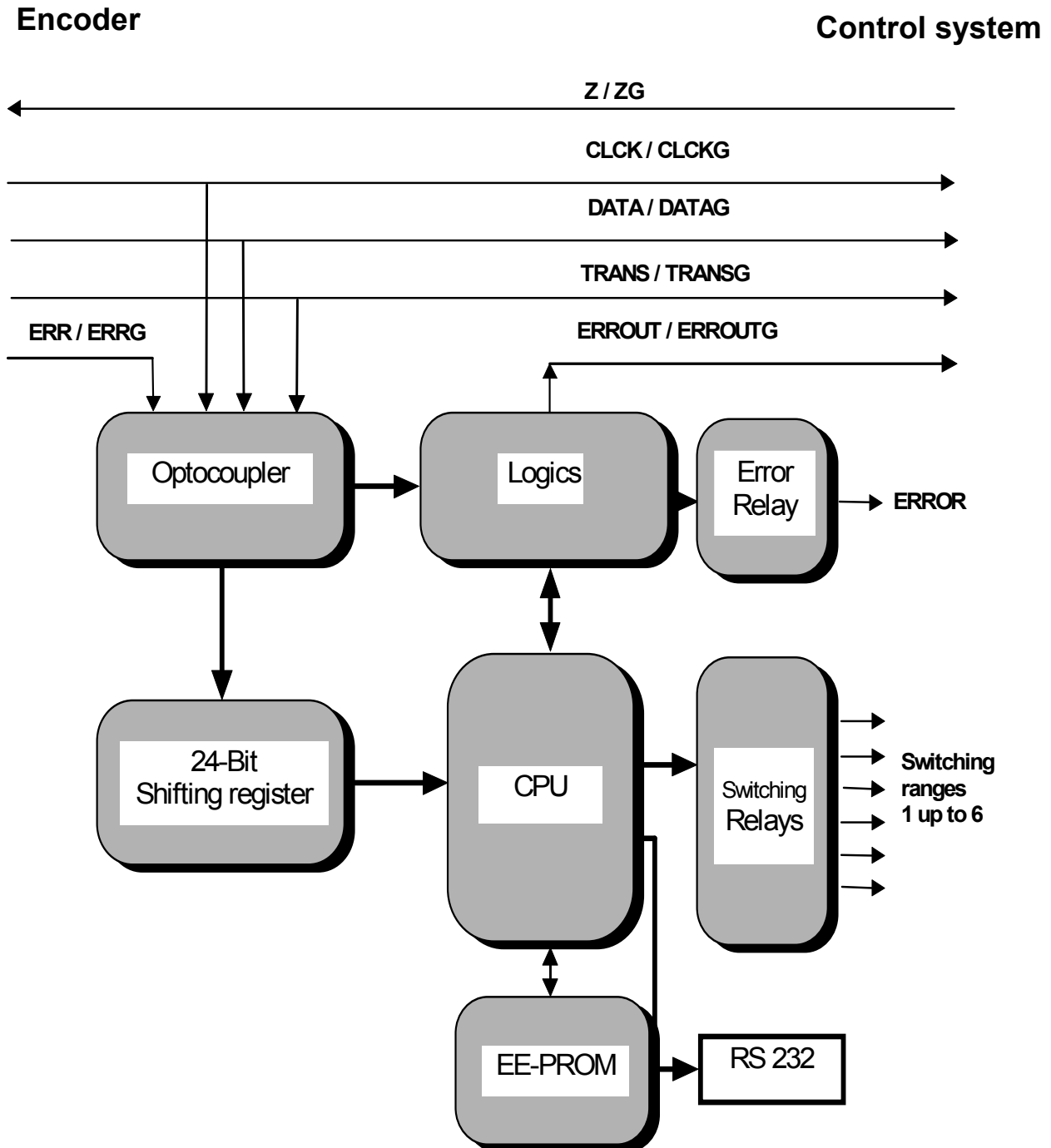
The conversion factor connects the positions measured at the machine and the corresponding absolute values. The factor can be entered manually into field „Conversion Factor“ or determined automatically by using display 2.



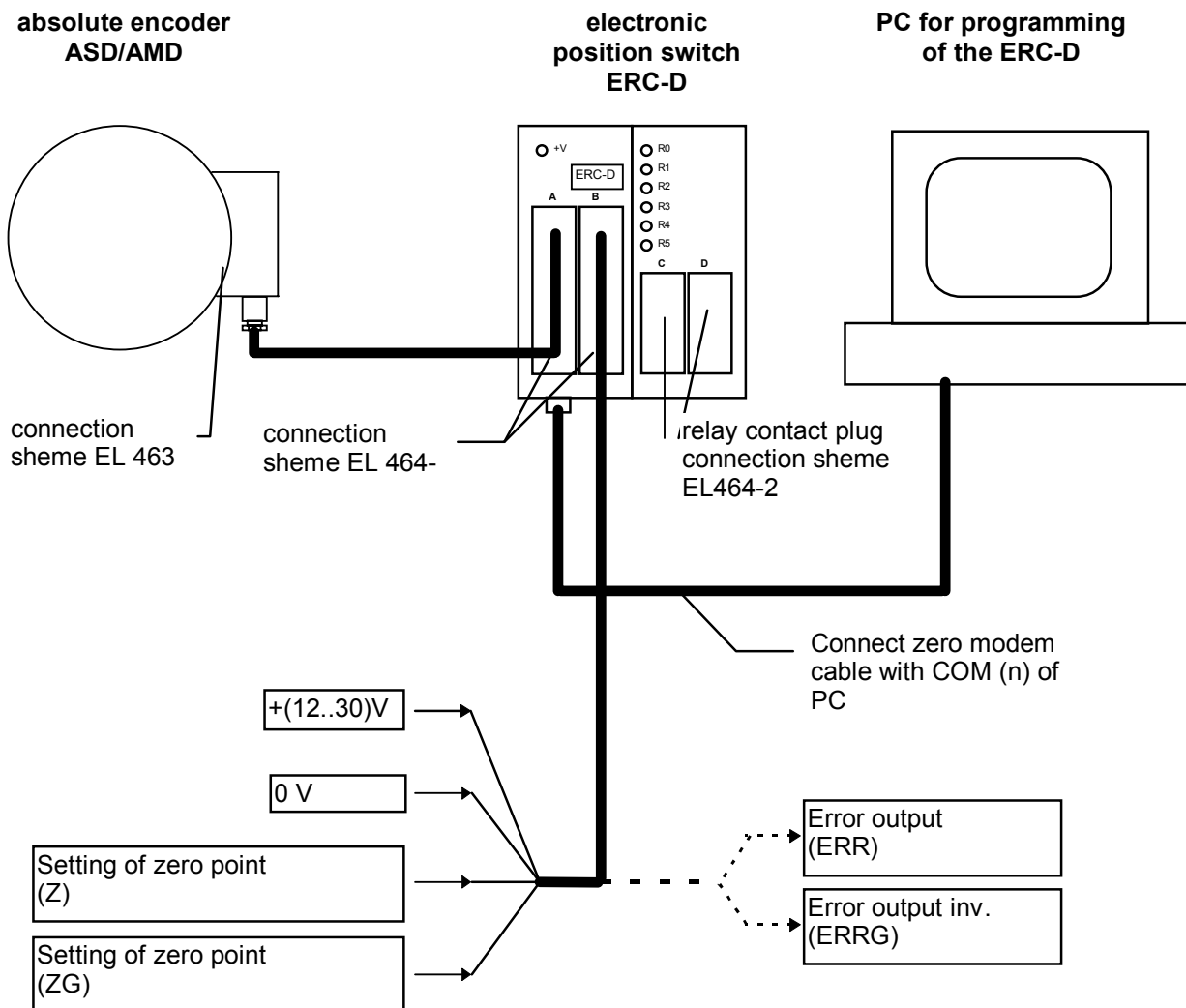
After switching on the supply voltage the encoder position will appear in field „1. Abs. value“. Enter the corresponding value measured at the machine into field „1. Position“ (close by „Return“). The machine position has to be changed as requested and the value of the new position will be entered into field „2. Position“. Display of field „2. Abs. value“ will change correspondingly. After closing by „Return“ the conversion factor resulting on the input data will appear in field „Factor“.

When closing this window by actuating field ok, the factor will be taken over into Display 1.

Electronic position switch ERCD (Block diagram)



Connection scheme ASD/AMD - ERC-D - PC



Attention:

The connections Z and ZG (Setting of zero point) have to be connected to the corresponding signals. When inverted signal is missing a connection of ZG to 0V has to be made.