

RS - SPM

Serial parallel translator module

Qualität - made in Germany



General

This translator module converts serial data from absolute encoders with serial Interface (SSI) into parallel data.

The translator module has a micro controller system which continuously reads serial data from the encoder and recalculates it into the required parallel format. It is particularly user friendly and by means of a PC, it can easily be programmed with the necessary parameters, e. g.:

- the number of steps per turn and the number of turns
- the offset and the positional value for remote position setting
- the parity flag
- output code
- the SSI format of the encoder used

Features

Programmable parallel data output in Gray, Binary or BCD code.

Programmable number of steps per turn.

Programmable number of turns.

Programmable positional offset to suit the

mechanical configuration.
Programmable parity flag.

Programmable remote position setting

Programmable counting direction.

Encoder alarm function with codes to indicate failure types.

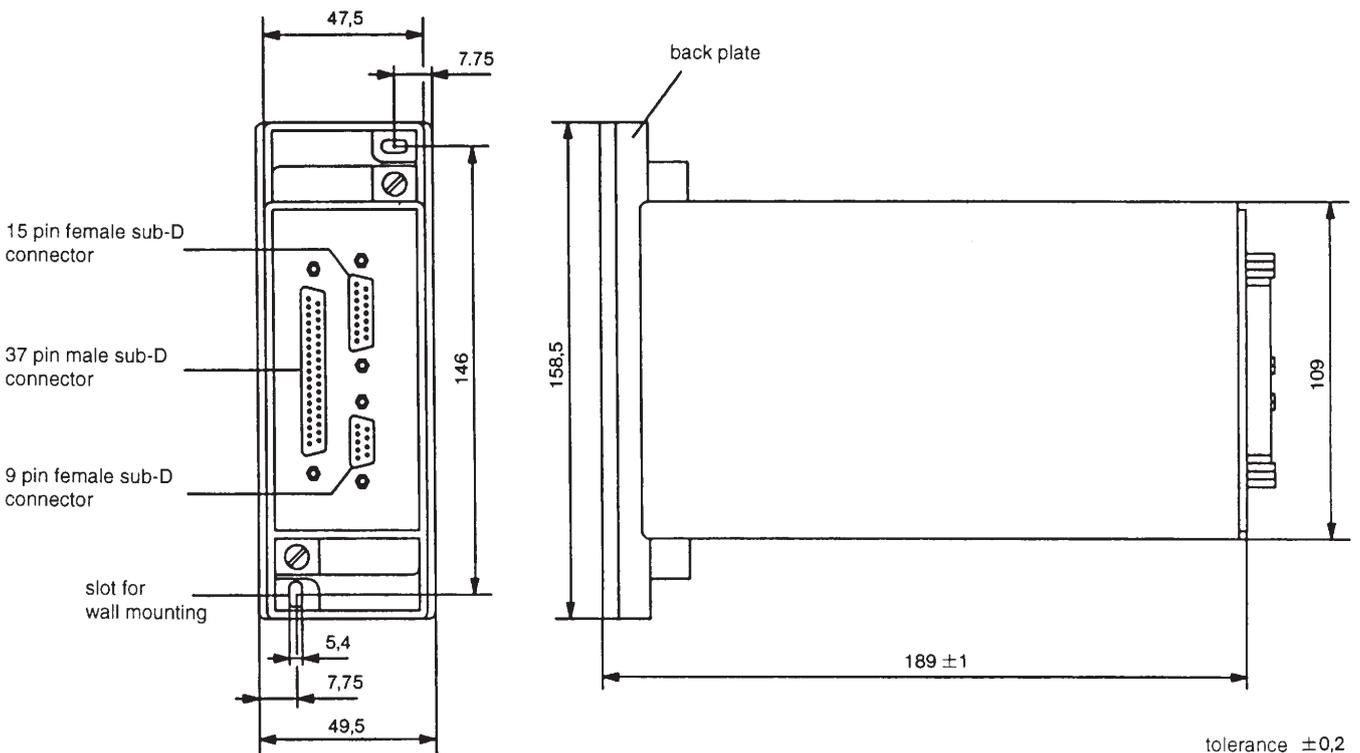
Entry and display of all parameters by means of a PC.

universal parallel data output line driver for push pull, tristate, current source and current sink operation, protected against reversed polarity and against short circuiting to either earth or supply voltage.

Synchronous serial interface differential output line drivers protected against reversed polarity and short circuiting to either earth or supply voltage. Renewal of encoder data in less than 400 µsec. Secure synchronous serial data transmission at 100 kHz clock frequency.

Non-volatile storage of all parameters in an EEPROM.

DC/DC converter for the internal power supply.



Technical data

Mechanical data

Operating temperature range	0...+50°C
Storage temperature range	-20...+85°C
Max. weight	< 0,4 kg
Dimensions (length x width x depth)	See diagrams page 3, 4, 5
Connectors	1 x 37 pin male SUB-ID connector 1 x 15 pin female SUB-ID connector 1 x 9 pin female SUB-ID connector
Housing	synthetic
Protection type	IP 20

Electrical data

Power supply, for RS SPM Us (Geber, RS SPM)	11 –32 VDC
Max. power consumption without load on Up and without encoder	3 W
Line driver operating voltage range Up (driver)	4,5...32 VDC
Encoder power supply	10...32 VDC
Us (encoder, RS SPM)	10...32 VDC

Max. current consumption without load
on Up and without encoder 250 mA

Max. cable length between RS SPM
and encoder 400 m

Electronic data

Clock frequency for serial encoders	100 kHz
Max. frequency of parallel data	12,5 kHz

Note: The encoders can be used at significantly higher data frequencies than 2.5 kHz. In this case, the increments between consecutive steps will no longer be one.

Time delay for Store function 30...70 PS

Time delay for Enabl-e function 20...60 PS

Time delay for remote position
setting function (with EEPROM) 700 ms

Line driver

For the parallel interface

Push-pull line driver, continuously short circuit and over-voltage protected, for tristate operation

Min. driver voltage $U_{P_{min}}$ 4,5 V

Max. driver voltage $U_{p_{max}}$ 32 V

Max. driver source or sink current $I_{d_{min}}$ 50 mA
at 20°C, at U_p 4,5 V - 32 V

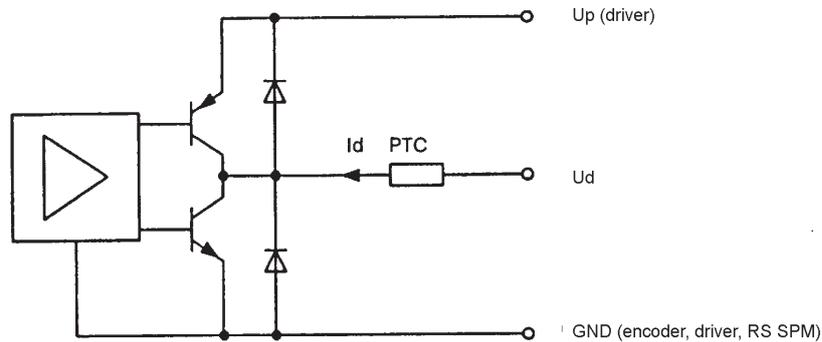
Max. driver source or sink current $I_{d_{min}}$ 30 mA
at 70 °C, at U_p 4,5 V - 32 V

Logic high voltage $U_{dH_{min}}$ bei 20°C $U_p - 4,6 V$
 $I_{dH} = 20 mA$ and $4,6 V < U_p < 32 V$

Logic low voltage $U_{dL_{max}}$ at 20°C 3,9 V

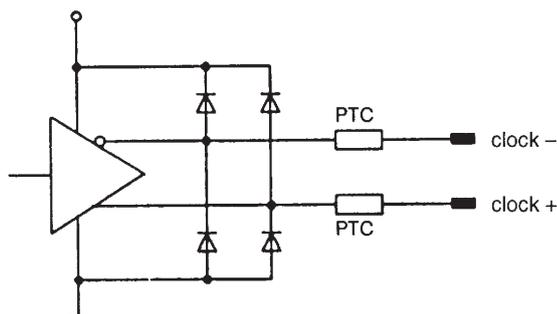
For the serial interface to the absolute encoder

Serial output switching (RS 485) protected against reversed polarity and short circuiting to either earth or supply voltage.



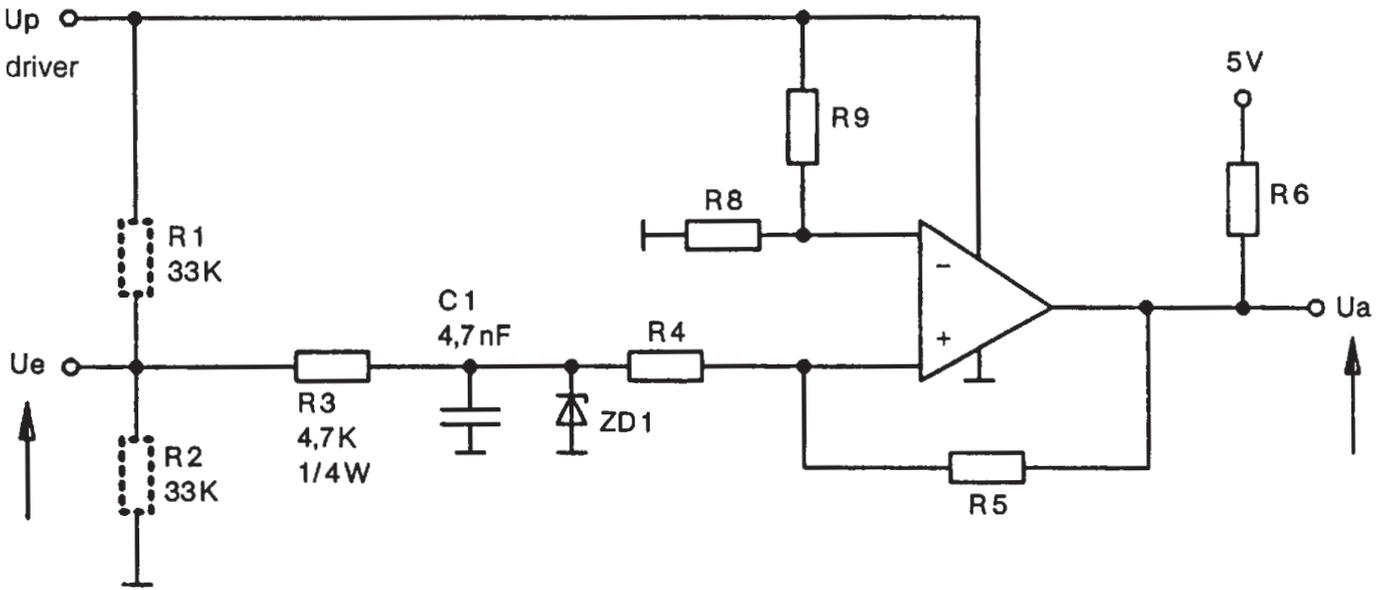
For the serial interface to the absolute encoder

Serial output switching (RS 485) protected against reversed polarity and short circuiting to either earth or supply voltage.



Control inputs

For the parallel interface

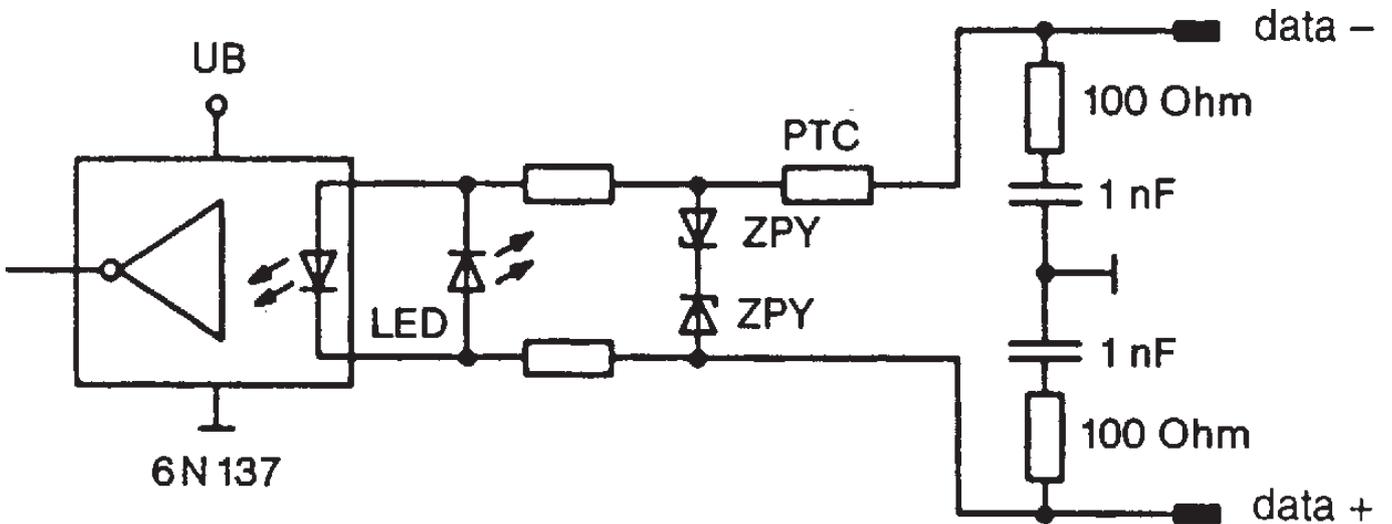


All control inputs have the same basic circuit and have either resistor R 1 or R 2 depending on the function of the input. The resistor is chosen so that when the control input is inactive, data output can occur, e.g. Store is fitted with R 1 and input Enable is fitted with R2.

+ UP	switching threshold for logic 1	hysteresis
5 V	$U_e > 2,6 V + 0,1 V$	$1,45 V + 0,1 v$
12 V	$U_e > 6,1 V + 0,1 V$	$1,55 V + 0,1 V$
24 V	$U_e > 12,2 V + 0,1 V$	$1,60 V + 0,1 V$
switching delay 20 psec ... 60 psec		

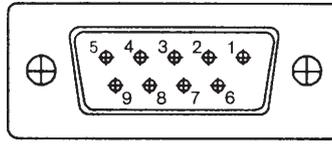
For the serial interface to the absolute encoder

Serial input switching 6 N 137, protected against short circuiting to either earth or supply voltage.



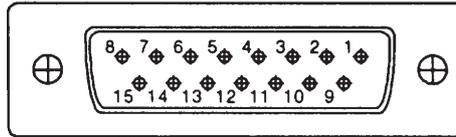
Pin-outs

9pin female SUB-D-connector for PC



Pin	Signal	Explanation
1,6	GND (encoder, driver, RS SPM)	Earth reference point for RxID and TxID
2	TxD	Transmit data: transmitting signal for the asynchronous serial interface
3	RxD	Receive data: receiving signal for the asynchronous serial interface
4	Service	This signal activates the RS SPM's service mode. It is activated when the connecting cable between RS SPM and the PC is inserted. When Service is activated, the RS SPM goes into „parameter input“ mode.
5, 9	UB	5 V power supply
7, 8	N. C.	not connected
	Screen	The housing is electrically connected to the front plate.

15 pin female SUB-D-connector for serial interface encoders

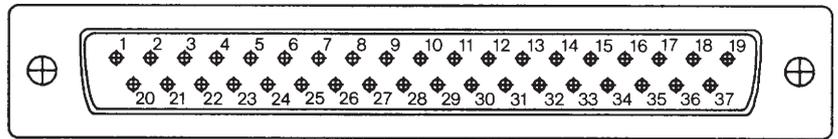


Pin	Signal	Explanation
1	GND (encoder, driver, RS SPM)	Earth reference point for RxID and TxID
2	Data +	Positive serial data input signal from the encoder. To be connected to Data + output from the encoder.
3	Clock +	Positive clock output signal from a RS 485 driver. To be connected to Clock + from the encoder.
8	+Us (encoder, RS SPM)	Encoder power supply. Please read label on the encoder prior to use.
10	Data -	Inverted serial data input signal from the encoder. To be connected to Data - from the encoder.
11	Clock -	Inverted clock output signal from a RS 485 driver. To be connected to Clock - from the encoder.
4, 5,6, 7, 9, 12,13, 14 15	N. C.	not connected

Note: ReSatron absolute serial encoders AG have a cw/ccw input to select the counting direction. This input must not be used with the RS SPM. The RS SPM can, however, be programmed to give the required counting direction.

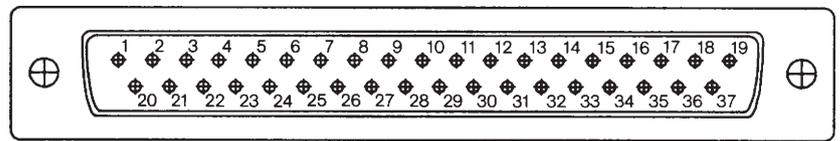
Pin-out

37 pin male SUB-D-connector for the SPA 2 parallel interface



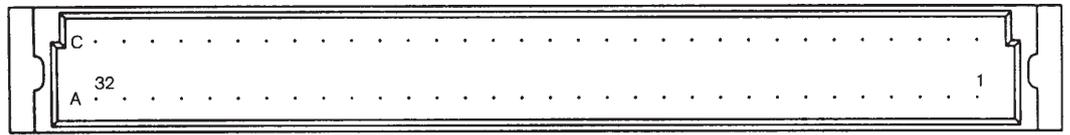
Pin	Signal	Explanation
1,20	GND (encoder, driver, RS SPM)	Earth connection for RS SPM, encoder and line drivers.
13	+Us (encoder, SPA 2)	Power supply for the encoder and RS SPM. Please read label on encoder prior to use.
31	Up (driver)	Positive supply voltage for line drivers. Isolated from Us (encoder, SPA 2) > 4,5 V < 32 V.
12	Enable	This inputs activates the RS SPM line drivers. At "High" the outputs are inactive. When unconnected, this input is at logic 0.
11	Parity	Output for the parity bit.
30	Store	This input stores output data at "Low". When unconnected it is at "High".
29	Remote position setting	When this input is at logic 1, the position of the encoder is reset to the programmed value. This input must be held at logic 1 for at least 0.6 sec. When unconnected, this input is at logic 0.
32	Error	Normally, this output remains at logic 1. If a fault is detected, it switches to logic 0. The fault types are coded as follows 0 = RS SPM in Service mode 1 = power down 2 = encoder interrogation fault 4 = remote position setting
19	N. C.	not connected

**37pol. SUB-D-connector
for the RS SPM, parallel interface**



Pin	Signal			Explanation
	Binär	Gray	BCD	
2	2^0	G_0	$2^0 \text{ v. } 10^0$	Data outputs
21	2^1	G_1	$2^1 \text{ v. } 10^0$	
3	2^2	G_2	$2^2 \text{ v. } 10^0$	
22	2^3	G_3	$2^3 \text{ v. } 10^0$	
4	2^4	G_4	$2^0 \text{ v. } 10^1$	
23	2^5	G_5	$2^1 \text{ v. } 10^1$	
5	2^6	G_6	$2^2 \text{ v. } 10^1$	
24	2^7	G_7	$2^3 \text{ v. } 10^1$	
6	2^8	G_8	$2^0 \text{ v. } 10^2$	
25	2^9	G_9	$2^1 \text{ v. } 10^2$	
7	2^{10}	G_{10}	$2^2 \text{ v. } 10^2$	
26	2^{11}	G_{11}	$2^3 \text{ v. } 10^2$	
8	2^{12}	G_{12}	$2^0 \text{ v. } 10^3$	
27	2^{13}	G_{13}	$2^1 \text{ v. } 10^3$	
9	2^{14}	G_{14}	$2^2 \text{ v. } 10^3$	
28	2^{15}	G_{15}	$2^3 \text{ v. } 10^3$	
14	2^{16}	G_{16}	$2^0 \text{ v. } 10^4$	
33	2^{17}	G_{17}	$2^1 \text{ v. } 10^4$	
15	2^{18}	G_{18}	$2^2 \text{ v. } 10^4$	
34	2^{19}	G_{19}	$2^3 \text{ v. } 10^4$	
16	2^{20}	G_{20}	$2^0 \text{ v. } 10^5$	
35	2^{21}	G_{21}	$2^1 \text{ v. } 10^5$	
17	2^{22}	G_{22}	$2^2 \text{ v. } 10^5$	
36	2^{23}	G_{23}	$2^3 \text{ v. } 10^5$	
37	2^{24}	G_{24}	$2^0 \text{ v. } 10^6$	
10, 18	N. C.	Not connected		
	Screen	The connector housing acts as a screen and is electrically connected to the front plate.		

Pin-out



64pin VG male connector for the RS SPM, parallel data output and the encoder serial data interface

Pin	Signale	Explanation
1a, 1c, 2c, 25a, 25c	GND (encoder, RS SPM)	Earth connection for RS SPM and encoder
13c, 32c,	+Us (encoder, RS SPM)	Power supply for the encoder and RS SPM.
32a		Please read label on encoder prior to use.
31a	Up (driver)	Positive supply voltage for line drivers. Isolated from Us (encoder, RS SPM), i.e. Up=open.
10c	Enable	This input activates the RS SPM line drivers. At „High“ the outputs are inactive. When unconnected, this input is at logic 0.
19a	UB	If the SPA 2 is used with a 5 V power supply voltage connected through UB, +Us (encoder, SPA 2) must not be connected. The power supply from the encoder cannot then be obtained from the 15 pin SUB-D connector.
19c	N. C.	not connected
22a	Error	Normally, this output remains at logic 1. If a fault is detected, it switches to logic 0. The fault types are coded as follows 0 = RS SPM in service mode 1 = power down 2 = encoder interrogation fault 4 = remote position setting
24a	Remote position setting	When this input is at logic 1, the position of the encoder is reset to the preprogrammed value. This input must be held at logic 1 for at least 0.6 sec. When unconnected, this input is at logic 0.
24c	Store	This input stores output data at“Low“. When unconnected, it is at“High“
26a	Data -	Inverted serial data input signal from the encoder. To be connected to Data - from the encoder.
26c	Data +	Positive serial data input signal from the encoder. To be connected to Data + from the encoder.
27a	Clock -	Inverted clock output signal from a RS 485 driver. To be connected to clock - from the encoder.
27c	Clock +	Positive clock output signal from a RS 485 driver. To be connected to Clock + from the encoder.
28c	Parity	Output for the parity bit.

RS SPM**Pin-out**

64pol. VG male connector for the RS SPM, parallel data output and the encoder serial data interface

Pin	Signal			Explanation
	Binär	Gray	BCD	
2a	2^{24}	G_{24}	$2^0 \text{ v. } 10^6$	Data outputs
3c	2^0	G_0	$2^0 \text{ v. } 10^0$	
3a	2^1	G_1	$2^1 \text{ v. } 10^0$	
4c	2^2	G_2	$2^2 \text{ v. } 10^0$	
4a	2^3	G_3	$2^3 \text{ v. } 10^0$	
5c	2^4	G_4	$2^0 \text{ v. } 10^1$	
5a	2^5	G_5	$2^1 \text{ v. } 10^1$	
6c	2^6	G_6	$2^2 \text{ v. } 10^1$	
6a	2^7	G_7	$2^3 \text{ v. } 10^1$	
7c	2^8	G_8	$2^0 \text{ v. } 10^2$	
7a	2^9	G_9	$2^1 \text{ v. } 10^2$	
8c	2^{10}	G_{10}	$2^2 \text{ v. } 10^2$	
8a	2^{11}	G_{11}	$2^3 \text{ v. } 10^2$	
9c	2^{12}	G_{12}	$2^0 \text{ v. } 10^3$	
9a	2^{13}	G_{13}	$2^1 \text{ v. } 10^3$	
14c	2^{14}	G_{14}	$2^2 \text{ v. } 10^3$	
14a	2^{15}	G_{15}	$2^3 \text{ v. } 10^3$	
15c	2^{16}	G_{16}	$2^0 \text{ v. } 10^4$	
15a	2^{17}	G_{17}	$2^1 \text{ v. } 10^4$	
16c	2^{18}	G_{18}	$2^2 \text{ v. } 10^4$	
16a	2^{19}	G_{19}	$2^3 \text{ v. } 10^4$	
17c	2^{20}	G_{20}	$2^0 \text{ v. } 10^5$	
17a	2^{21}	G_{21}	$2^1 \text{ v. } 10^5$	
18c	2^{22}	G_{22}	$2^2 \text{ v. } 10^5$	
18a	2^{23}	G_{23}	$2^3 \text{ v. } 10^5$	
21c	2^{25}	G_{25}	$2^1 \text{ v. } 10^6$	
21 a	2^{26}	G_{26}	$2^2 \text{ v. } 10^6$	
22c	2^{27}	G_{27}	$2^3 \text{ v. } 10^6$	
23c	2^{28}	G_{28}	$2^0 \text{ v. } 10^7$	
23a	2^{29}	G_{29}	$2^1 \text{ v. } 10^7$	
10a, 11a, 11c, 12a,12c, 13a, 20a, 20c, 28a,29a, 29c, 30a, 30c,31c 10	N. C.			not connected

Connection details

Using the 37 pin SUB D connector listed in the accessories the following connections should be made: Parallel data lines, supply voltage for the RS SPM and the absolute encoder, power supply for the data output drivers, error signal output, parity signal output, store input and the teleshifting input. The cable screen should be connected to the connector housing.

Accessories

Programming software

37 pin female SUB-D-connector with connector pocket

15 pin male SUB-D-connector with connector pocket

