

Speed Controller

2-Quadrant PWM
configurable via PC

For combination with:
DC-Micromotors and
Brushless DC-Servomotors

Series SC 1801

		SC 1801 P	SC 1801 F	SC 1801 S	
Power supply for electronic	U _P	4,0 ... 18	4,0 ... 18	4,0 ... 18	V DC
Power supply for motor	U _{mot}	1,8 ... 18	1,8 ... 18	1,8 ... 18	V DC
Max. continuous output current ¹⁾	I _{dauer}	1	1	1	A
Max. peak output current	I _{max}	2	2	2	A
Total standby current	I _{el max}	0,018	0,018	0,018	A
Input/output (partially free configurable)		3	3	3	
Tightening torque, terminal strip		-	0,12 ... 0,15	0,12 ... 0,15	Nm
Weight		4	10	12	g
PWM switching frequency	f _{PWM}	96 (24)			kHz
Efficiency	η	95			%
Speed range:					
– BL motors with Hall sensors (digital)		500 ... 100 000			rpm
– BL motors with Hall sensors (analog)		50 ... 60 000			rpm
– DC motors with encoder		100 ... 30 000			rpm
Scanning rate		500			μs
Resolution of encoder with DC motors		≤ 65 535			inc./rev.
Operating temperature range		– 25 ... + 60			°C
Storage temperature		– 25 ... + 85			°C

¹⁾ at 22°C ambient temperature

Versions

Speed Controller	Option	Motor Type	Sensor Type	Version		Part No.	Conformity
				Set speed value specification ¹⁾	Speed at U _{nsoll} = 10 V		
SC 1801 S	3530	BL	Hall sensors (digital) ³⁾	0 ... 10 V	30 000 rpm	6500.01377	CE
SC 1801 S	3531	DC	Incremental encoder ²⁾	0 ... 10 V	10 000 rpm	6500.01393	CE
SC 1801 F	3533	BL	sensorless (high speed)	0 ... 10 V	40 000 rpm	6500.01378	CE
SC 1801 P	3530	BL	Hall sensors (digital) ³⁾	0 ... 10 V	30 000 rpm	6500.01379	
SC 1801 P	3531	DC	Incremental encoder ²⁾	0 ... 10 V	10 000 rpm	6500.01394	
SC 1801 S	3980	BL	Absolute encoder	0 ... 10 V	30 000 rpm	6500.01435	
SC 1801 P	3980	BL	Absolute encoder	0 ... 10 V	30 000 rpm	6500.01440	
SC 1801 F	3980	BL	Absolute encoder	0 ... 10 V	50 000 rpm	6500.01441	
SC 1801 S	4289	BL	Hall sensors (analog) ³⁾	0 ... 10 V	40 000 rpm	6500.01475	
SC 1801 P	4289	BL	Hall sensors (analog) ³⁾	0 ... 10 V	40 000 rpm	6500.01476	
SC 1801 F	4289	BL	Hall sensors (analog) ³⁾	0 ... 10 V	40 000 rpm	6500.01477	

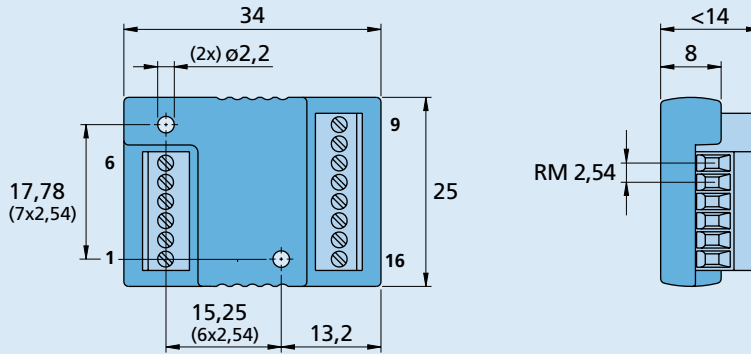
¹⁾ The velocity range can be configured by software. Versions with PWM and other configurations are available on request.

²⁾ preset value is 512 lines

³⁾ Factory pre-configured for 2 pole motors. For operation with 4 pole motors the speed controller must be reconfigured with the software "Faulhaber Motion Manager".

Accessories

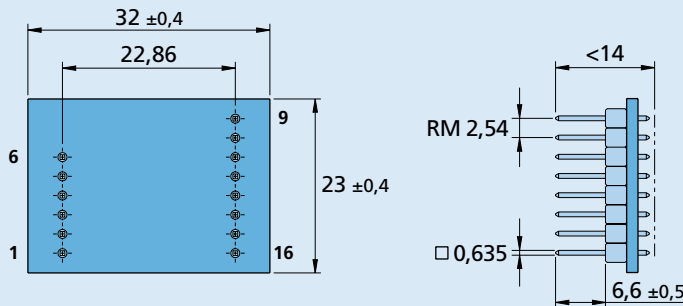
		Motor Type	for SC 1801 S Part No.
Programming adapter	Starterkit		6501.00088
Programming adapter			6501.00097
Motor connector adapter	0620 ... B	BL	6501.00083
	penny-motor	BL	6501.00090
	BX4	BL	6501.00085
Encoder adapter	IE2	DC	6501.00084
	HEDS	DC	6501.00001

Dimensional drawing and connection information SC 1801 S
 M 1:1


SC 1801 S

Connection

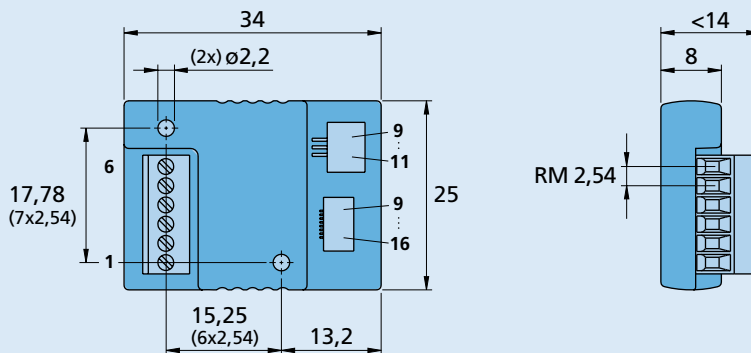
Pin	Function
1	Up
2	U _{mot}
3	GND
4	U _{soll}
5	DIR
6	FG
9	Mot C
10	Mot B
11	Mot A
12	SGND
13	V _{cc}
14	Sens C
15	Sens B
16	Sens A

Dimensional drawing and connection information SC 1801 P
 M 1:1


SC 1801 P

Connection

Pin	Function
1	Up
2	U _{mot}
3	GND
4	U _{soll}
5	DIR
6	FG
9	Mot C
10	Mot B
11	Mot A
12	SGND
13	V _{cc}
14	Sens C
15	Sens B
16	Sens A

Dimensional drawing and connection information SC 1801 F
 M 1:1


SC 1801 F

Connector Information
 LIF-Connector
 3-pole and 8-pole

Connection

Pin	Function
1	Up
2	U _{mot}
3	GND
4	U _{soll}
5	DIR
6	FG
9	Mot C
10	Mot B
11	Mot A
12	SGND
13	V _{cc}
14	Sens C
15	Sens B
16	Sens A

SC Function

Description of connections (Motor-dependent)

	DC-Motors with Encoder	BL-Motors with Hall sensors	BL-Motors with Absolute encoder	BL-Motors with digital Hall sensors + encoder	BL-Motors with digital Hall sensors + brake/enable
Connection "Mot A", "Mot B", "Mot C":					
- Motor connection	Mot A	Mot +	Phase A	Phase A	Phase A
	Mot B	Mot -	Phase B	Phase B	Phase B
	Mot C	reserved	Phase C	Phase C	Phase C
Connection "Sens A", "Sens B", "Sens C":					
- Sensor input	Sens A	reserved	Hall sensor A	Hall sensor A	Hall sensor A
	Sens B	encoder canal A	Hall sensor B	Hall sensor B	Hall sensor B
	Sens C	encoder canal B	Hall sensor C	Hall sensor C	Hall sensor C
	f	≤ 400 kHz			
Connection "IO1", "IO2"					
- logic input	IO1	reserved	reserved	reserved	encoder B
	IO2	reserved	reserved	reserved	encoder A
					brake enable

Connection information (general)

Connection "Up":	Up	power supply electronic
Connection "U_{mot}":	U _{mot}	power supply motor coil
Connection "GND":		ground
Connection "U_{nsoll}":		(standard version)
- analog input	set speed value	U _{in} = 0 ... 10 V / > 10 V ... max. U _p ¹⁾ U _{in} < 0,15 V U _{in} > 0,3 V (0,5 V) ²⁾
- digital input	PWM for set speed value	500 ... 18 000 Hz
	duty cycle	d = 0% d = 50% d = 100%
	input resistance	R _{in} ≥ 5 kΩ
	signal level PLC	7,5 ... U _p 0 ... 2
	signal level TTL ³⁾	2,8 ... U _p 0 ... 0,5
Connection "DIR":		
- digital input	direction of rotation	to ground or level < 0,5 V level > 3,0 V
	input resistance	R _{in} ≥ 10 kΩ
Connection "FG":		
- fault output		max. U _p /15 mA
- frequency output (BL motor only)		switched through to GND 1, 3, 6, 8, 16 ⁵⁾
Connection "IO1", "IO2":		
- digital input ⁶⁾		n.c.
	signal level TTL	2,8 ... U _p 0 ... 0,5
	(IO2)	high low
	(IO1)	high low
Connection "V_{cc}":		
	output voltage	5 V DC
	max. output current for	SC 1801 S, F, P SC 2402 P SC 2804 S SC 5004 P SC 5008 S
		for external use » I _{cc} = 25 mA » I _{cc} = 20 mA » I _{cc} = 30 mA » I _{cc} = 100 mA » I _{cc} = 100 mA
Connection "SGND":		signal ground

¹⁾ > 10 V for set speed value not defined.

²⁾ Data in parentheses apply to BL motors operating without sensors.

³⁾ Not available for SC 5004 / SC 5008

⁴⁾ 22 kΩ (SC 1801, SC 2402, SC 2804)

47 kΩ (SC 5004, SC 5008)

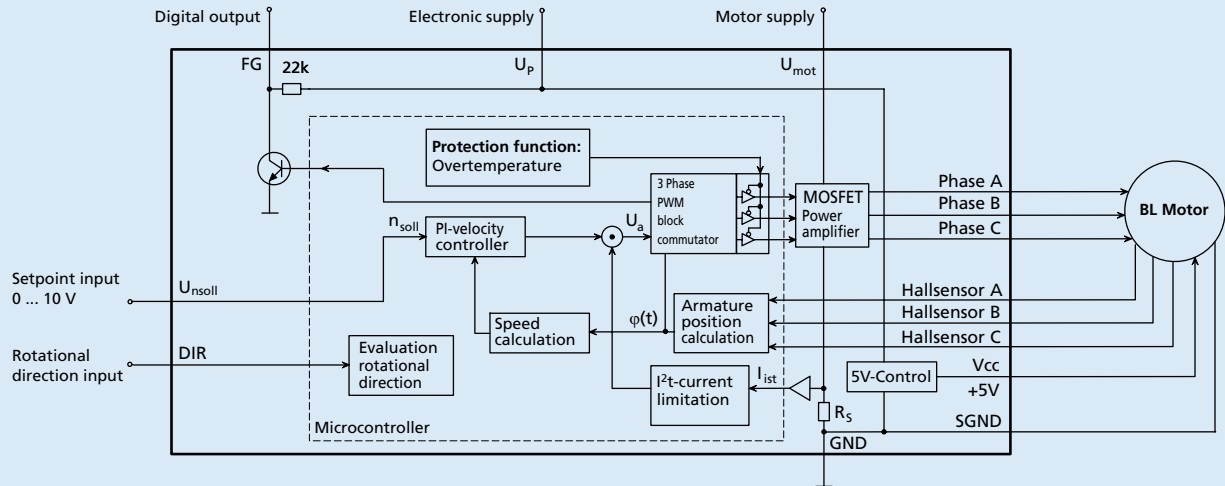
An additional external pull-up resistor can be added to improve the rise time.

Caution: I_{out} max. 15 mA must not be exceeded.

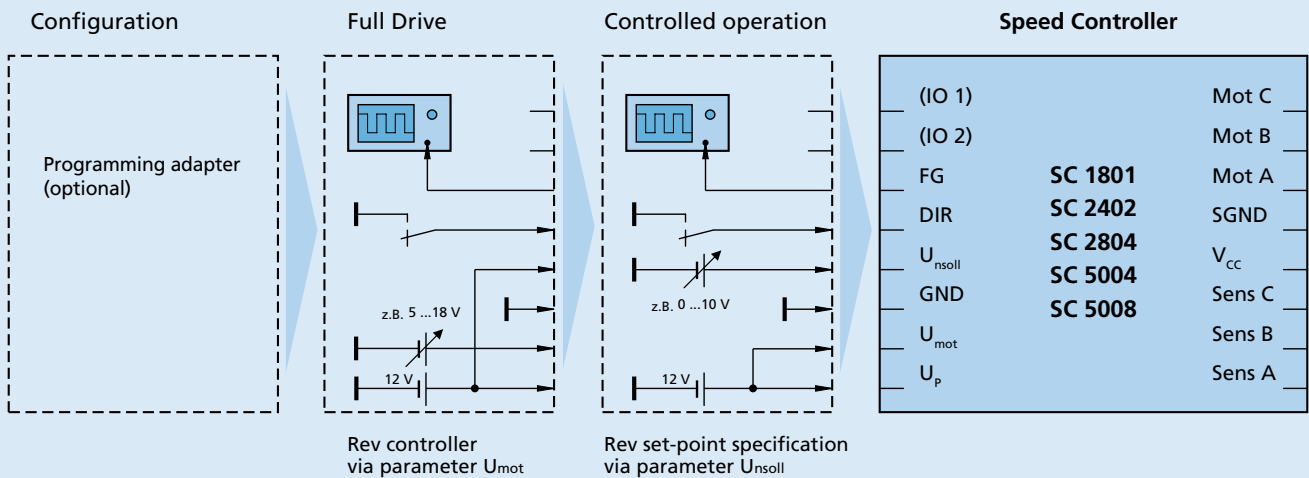
⁵⁾ Values apply to 2-pole motors. The given values double for 4-pole motors.

⁶⁾ With appropriate hardware.

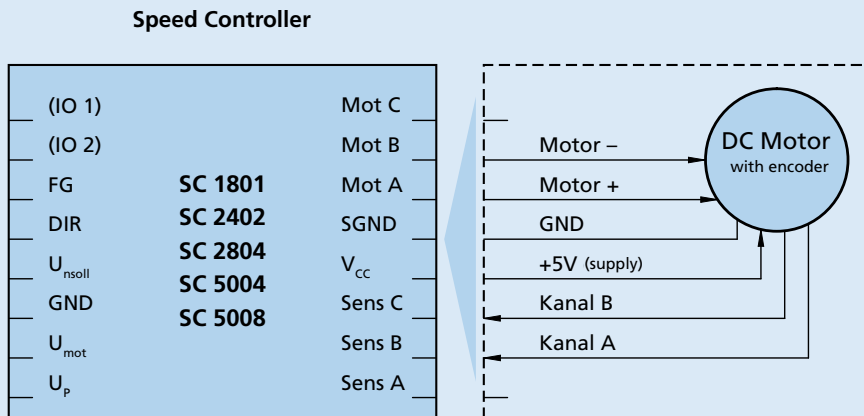
Circuit diagram - brushless with Hall sensors (Option 3530)



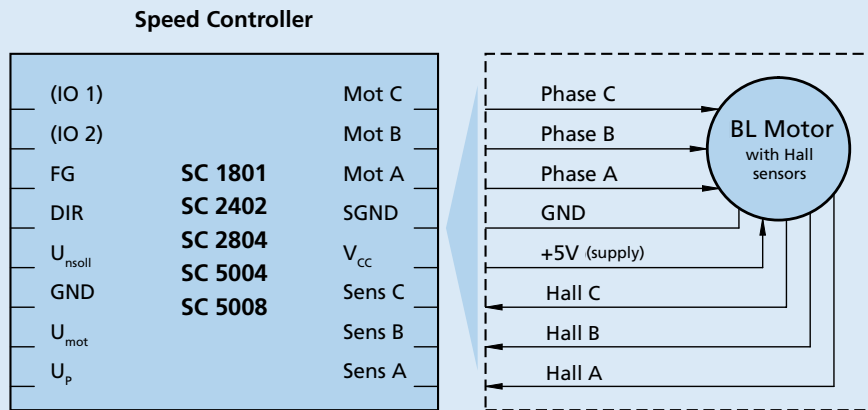
Connection diagram supply unit



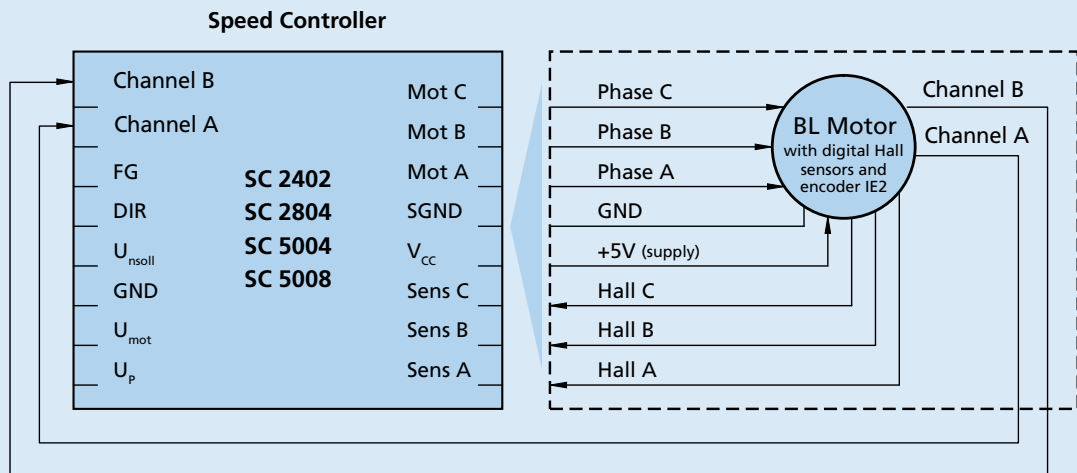
Connection diagram operation mode DC-Micromotor with encoder



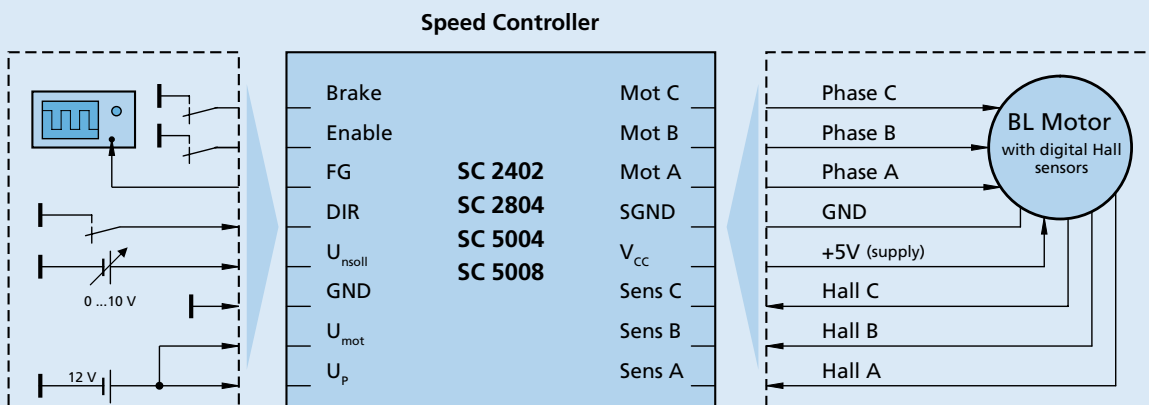
Connection diagram operation mode BL motor with Hall Sensors



Connection diagram operation mode BL motor with digital Hall Sensors and Encoder

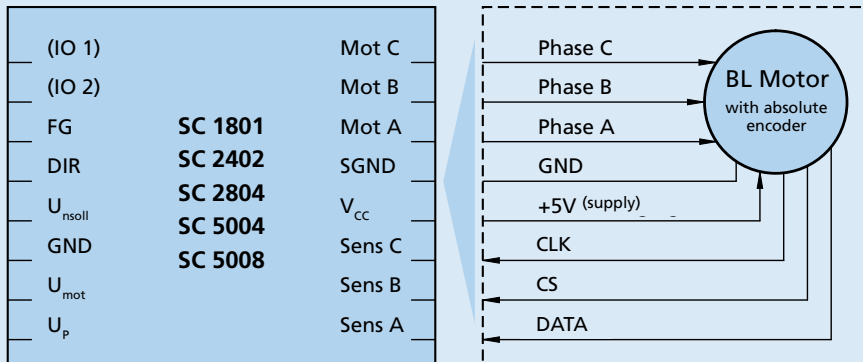


Connection diagram operation mode BL motor with digital Hall Sensors and Brake / Enable



Connection diagram operation mode BL motor with AES

Speed Controller



Connection diagram operation mode DC and BL motor sensorless

Speed Controller

