EEL-S2-1

EEL-S2-1
Control and protection of *easyE-line* actuators

Features:

- Adjustable start ramp
- Adjustable stop ramp
- Adjustable current limit
- Continuous-mode, impulse-mode
- High momentary load capacity
- Easy interfacing to PLC etc.
- Connectors and terminal
- DIN-rail fittable
- Status LED

Technical Data

- Supply: 10-35 VDC (filtered max ripple <30%@full load)
- Over voltage protection: 40 V
- Idle current Approx. 15 mA
- Driving current: 10 A continuous, 16 A with duty cycle 50% Max 16 A on duty 2 min
- Current limit: 0,5... 16 A
- Current trip delay: 20 ms
- Start delay: 5 ms
- Voltage loss: 0,5 V (Im = 4A)
- Operating frequency: 2000 hz
- Ramps: 0,1 ... 2,5 s
- Digital inputs:
  - 'High' @ Uin 4 V -> supply voltage,
  - 'Low' @ Uin 0 V -> 1 V
- Operating temp.: +5° to +40 °C

EEL-S2-1 is developed for controlled ON-OFF driving and direction change of the easyE-line actuators. EEL-S2-1 has advanced current limit features. It limits the actuator current in start-up, braking and jam-situations and in that way protects the motor and the mechanics. EEL-S2-1 also has a fault in- and output which indicates error/over-current status and can be used to stop the actuator (for example if an emergency-stop switch is used).

The start and stop ramp times are individually adjustable to suit each application. In other words the motor voltage is controlled to give a preferred smooth start and stop. When the EEL-S2-1 controller is without power, the motor is dynamically braked with so called short-circuit braking, i.e. the motor poles are connected together. The reverse and forward inputs can be set to work with negative or positive voltage by moving a jumper.

EEL-S2-1 has a 'trip' feature that cuts the motor voltage if the current limit value is exceeded (after trip delay of 2ms). After trip the motor can only be started in the opposite direction. Additionally the EEL-S2-1 provides 'kick-start' which means 100ms at full speed (100%PWM). Current limit during kickstart is up to 35A.

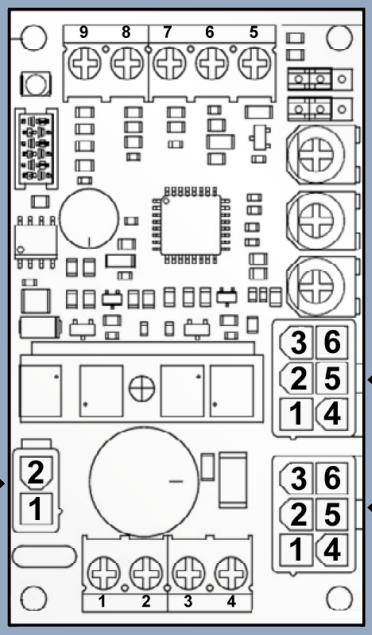
If the actuator is stopped without going into trip mode, then the EEL-S2-1 controller will allow 50% higher current from start and until 500ms after ending start ramp.

Wiring S2-1

Molex 2-pin connector
for power supply

Pin 2: 10-35VDC
Pin 1: GND

Note: If the power consumption is higher than 8A continuously, screw terminals must be used due to the size of leads in layout. Pin 1 is Supply GND, Pin 2 is Supply + (12VDC/24VDC).



Molex 6-pin connectors
with same connection for both actuator and control.

House type for cable: 5557
Terminal type: 5556

Pin 1: Actuator +
Pin 2: Control: Common (GND)
Pin 3: Control: Rev/In
Pin 4: Actuator -
Pin 5: Fault in/out
Pin 6: Control: Fwd/Out

Note: If actuators with hall sensors are used with these connectors, the 4 hall wires must be disconnected

Screw Terminals

1 Supply GND
2 Supply + (10-35 VDC) fuse required
3 Actuator –
4 Actuator +
5 +5 V output for control-use max. 10 mA load
6 Fault in- and output
7 Reverse (Rev/In) signal input (0,5 mA)
8 Forward (Fwd/Out) signal input (0,5mA)
7+8 Used to activate the actuator reverse and forward. Please refer to description of ‘Control mode’ on page 3
9 GND for control-use (not to be used as supply input)

General

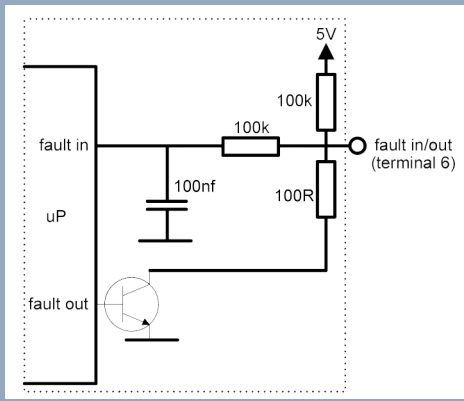
LED signals: Fast blink: Current trip, Four blinks: Over-voltage, Solid light: Overtemp

Current limit during start ramp and 500ms thereafter is current limit plus 50%.

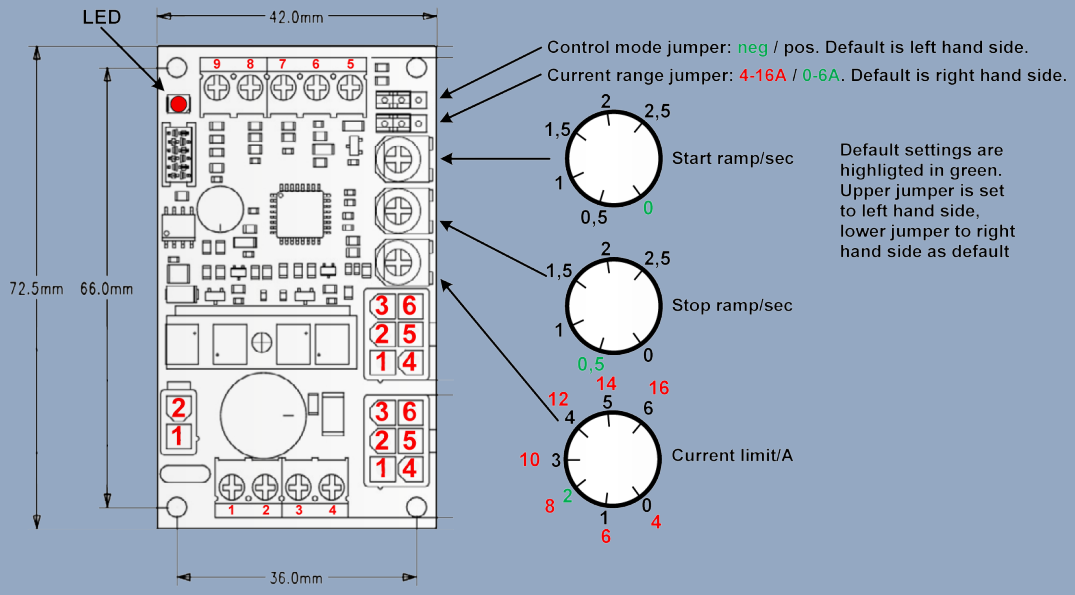
After trip the motor can only be started in the opposite direction. Additionally the S2-1 after trip provides ‘kick-start’, which means 100ms at full speed (100%PWM). Current limit during kick-start is up to 35A.

The fault terminal is both input and output (see circuit diagram). During normal operation the signal is pulled high to 5 V on the S2-1 board in series with a 100k re-sistor. When a fault occurs the fault terminal changes to low voltage (GND via 100R resistor).

Circuit diagram



Settings and mechanical dimensions



Control mode

When jumper is put in mode ‘neg’ (left hand side) then a negative (GND) signal is put on terminal 7 and 8 to run motor.

When using ‘neg’ mode, then terminal 9 can be used as the negative supply.

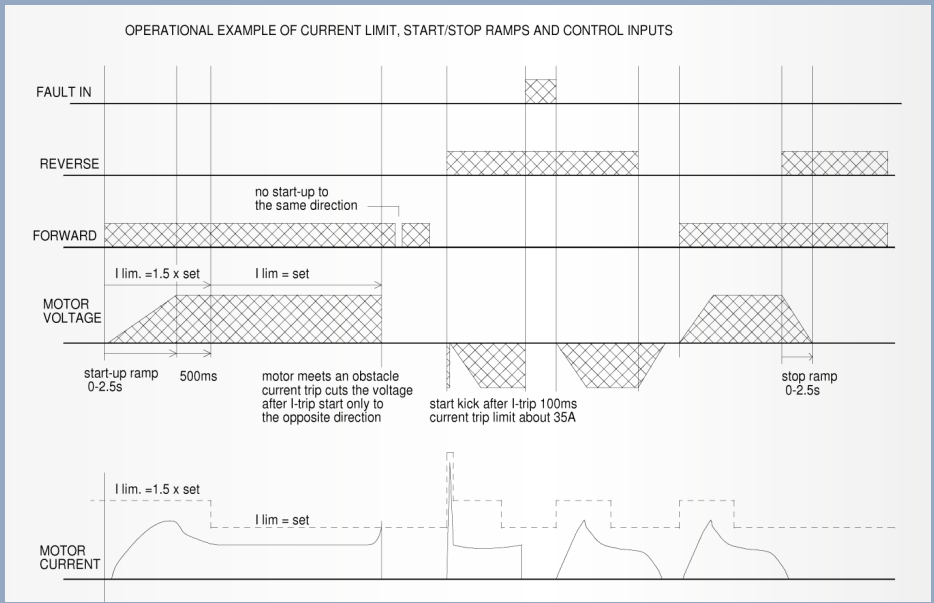
When jumper is put in mode ‘pos’ (jumper in right side) then a positive (> 4 V) signal is put on terminal 7 and 8 to run motor.

When using ‘pos’ mode, then terminal 5 can be used as the positive supply.

NOTE: When using the connectors for remote control, then the jumper MUST be in ‘neg’ mode (left side).

Input current for reverse & forward control is 0.5mA.

Settings and mechanical dimensions



EEL-S2-1-A

(board alone)
73 x 43 x 25 mm (L x W x H)

EEL-S2-1-B

(box version)
102 x 73 x 47 mm (L x W x H)

EEL-S2-1-D

(DIN rail version)
90 x 46 x 56 mm (L x W x H)

Warnings and recommendations

- If S2-1 goes into “trip” (overcurrent), it is only possible to run actuator in opposite direction.
- Please adjust the max. current to be 10% higher than maximum current during running the actuator.
- This gives the best conditions for long motor and actuator mechanical and electrical lifetime.
- It is very important to ensure that the power supply for the controller is capable of supplying sufficient current – otherwise the controller and the actuator may be damaged.
- Doublecheck correct polarity of power supply. If wrong connected, the S2-1 will be damaged.
- Attention! Driver has no fuse in it. Use external fuse according to application (2 -> 16A slow).
- Bansbach does not have any responsibility over the possible errors in this data sheet. Specifications are to be changed without notice.

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