Product Name
ESB10.4 – UL Version

Description	ESB10.4 – UL Version
	4-channel current limiter with UL certification In industrial control applications, DC power supplies are typically used to provide power, and solid-state overcurrent protectors are an ideal solution for selective protection of system components in DC applications. It has a selective tripping function, which can provide optimal overload or short circuit protection for various loads and ensure the normal operation of non-fault circuits without being affected, thereby ensuring the uninterrupted operation of the production process.

Characteristics	
	24 VDC power supply output side
	24 VDC current distribution
	PLC, solenoid valve, sensor, actuator, etc. control load protection
	Installation type: DIN rail module, one-piece
	Product type: Solid-state overcurrent protector
	Number of positions: 1
	Number of channels: 4
	Protection class: III
	Pollution degree: 2
	Width: ≤41 mm
	Height: ≤130mm
	Depth: ≤127 mm (incl. DIN rail 7.5 mm)

Technical Data	
Operating voltage	18-30 VDC
Rated voltage U_N	24 VDC
Total rated current I_{NM}	max. 40 ADC (IN+ with at least 1x6 mm²) (10 ADC per channel)
Single channel rated current I_N	1-10 ADC (10 levels adjustable per output channel)
Rated current (pre-adjusted)	10 A
Rated surge voltage	0.5 kV
Tripping method	E (electronic)
Required backup fuse	Only required if Imax of the power supply > the short circuit switching capacity. Integrated fail-safe element.
Short-circuit breaking capacity	1000 A
Dielectric strength	max. 30 VDC (load circuit)
Efficiency	>99 %
Closed circuit current I_O	typ. 50 mA
Power dissipation	≤1.2 W (no-load operation) ≤9.5 W (nominal operation)
Module initialization time	50 ms to 0.5 s
Waiting time after switching off of a channel	≤10 s (at overload/short circuit)
Measuring tolerance I	typ. 10 % rated current
MTBF (IEC 61709, SN 29500)	600,000 h (at 25 °C)
Fail-safe element	30 ADC (per output channel)

Protection and Remote Alarm	
Shutdown time	max. 55 ms (>1.5 I_N) 2.2 s (1.3-1.5 I_N) 33 s (1.05-1.3 I_N)
Undervoltage switch-off	≤18 VDC automatically restore the original state after voltage recovery
Overvoltage switch-off	≥30 VDC automatically restore the original state after voltage recovery
Remote alarm signal	N/C dry contact signal (13/14), max. 60 V @ 0.1 A
Remote reset signal	Pulse width > 200 ms (first pull high and then set low →H→L)
Communication Protocol	RS485, Baud rate 19200 bps

Operation and Status Indication	
Group power down	DC OK press for 3 s
Circuit operate	channel button short press for on / off / reset
Knob operate	Rotate + Press channel button for 2 s
DC OK LED off	Off (No supply voltage)
DC OK LED yellow	Undervoltage active, voltage ≤ 18 V, active channels switched off and channel LEDs are lit red
DC OK LED yellow flashing	Undervoltage switch-off inactive, but need to click the button to reset the LED status
DC OK LED green	Operating voltage in nominal range 18-30 V
DC OK LED red	Overvoltage switch-off active, voltage ≥ 30 V, channels switched off and channel LEDs are lit red
DC OK LED red flashing	Overvoltage switch-off inactive, but need to click the button to reset the LED status
Channel LED off	Channel switched off
Channel LED yellow	Channel switched on, channel load > 80 % I_N
Channel LED yellow-green flashing	Channel current is at the rated critical value and needs to be increased by one level to restore it
Channel LED green	Channel switched on
Channel LED green flashing	Channel rated current being changed through a knob, but it has not been activated (long press for 2 s to activate)
Channel LED green fast flashing (~2 Hz)	Channel voltage is being established during startup
Channel LED red	Channel switched off, over- or undervoltage active
Channel LED red flashing	Channel switched off and ready to be switched back on, which can be reset by clicking the channel button or remotely
Channel LED red-yellow flashing	Channel in overload mode of 105-130 % I_N, switch off after 30 s

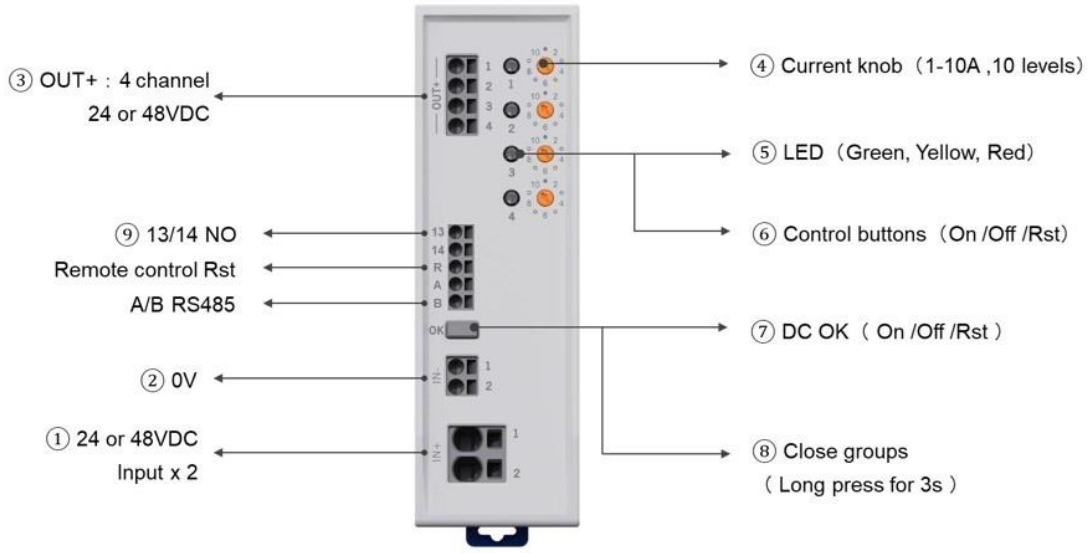
Connection Information	
IN+ connection method	Push-in connection
IN+ stripping length	15 mm
IN+ conductor cross section solid	0.5-10 mm²
IN+ conductor cross section AWG	20-8
IN+ conductor cross section flexible, with ferrule, with plastic sleeve	0.5-6 mm²
IN+ conductor cross section flexible, with ferrule, without plastic sleeve	0.5-6 mm²
IN- connection method	Push-in connection
IN- stripping length	10 mm
IN- conductor cross section solid	0.8-2.5 mm²
IN- conductor cross section AWG	18-12
IN- conductor cross section flexible, with ferrule, with plastic sleeve	0.8-1.5 mm²
IN- conductor cross section flexible, with ferrule, without plastic sleeve	0.8-2.5 mm²
OUT connection method	Push-in connection
OUT stripping length	10 mm
OUT conductor cross section solid	0.2-2.5 mm²
OUT conductor cross section AWG	24-12
OUT conductor cross section flexible, with ferrule, with plastic sleeve	0.25-1.5 mm²
OUT conductor cross section flexible, with ferrule, without plastic sleeve	0.25-2.5 mm²
Remote signaling conductor cross section solid	0.2-3.3 mm²
Remote signaling conductor cross section AWG	24-12
Remote signaling conductor cross section flexible, with ferrule, with plastic sleeve	0.25-3.3 mm²
Remote signaling conductor cross section flexible, with ferrule, without plastic sleeve	0.25-3.3 mm²

Material Specification		
Color	Panel	White
	Housing	Gray
	Terminal blocks	Gray
	Knob	Yellow
Material	Housing	PA6
	Terminal blocks	PA66
	Light emission area	PC
	Knob	**ABS+PC**
Environmental directives		RoHS2.0
Flammability rating according to UL 94		V-0

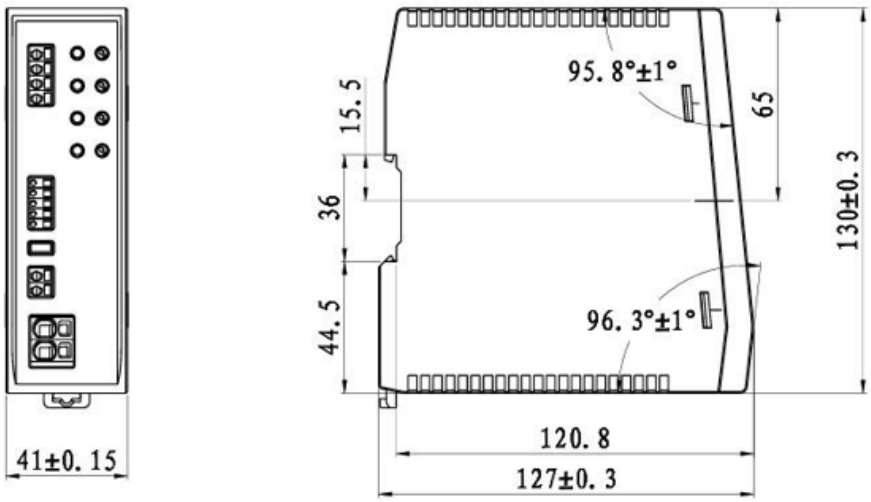
Working Environment	
Degree of protection	IP20
Ambient temperature (operation)	-25 °C to 70 °C
Ambient temperature (storage/transport)	-40 °C to 80 °C
Altitude	≤2000 m
Humidity test	240 h, 95 % RH, 40 °C
Salt spray test	Parts for 72 h, entire machine for 48 h
Shock (operation)	30 g (IEC 60068-2-27, Test Ea)
Vibration (operation)	5 Hz to 24.9 Hz (amplitude ±1.6 mm; in accordance with IEC60068-2-6, Test Fc) 24.9 Hz to 150 Hz (acceleration 4 g; in accordance with IEC60068-2-6)

Interfaces and Dimensions

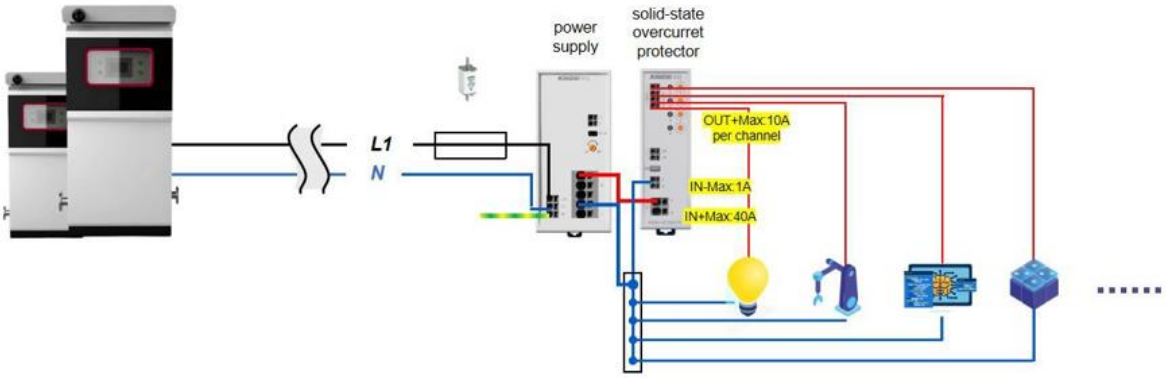
Product shape and interfaces:



Dimensions (mm):

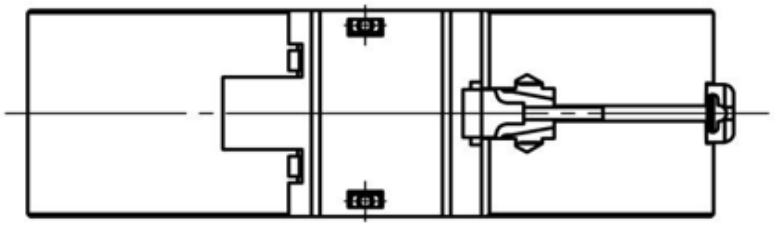


Installation schematic:



Installation method:

DIN rail module, one-piece



Operation and instructions:

Safety precautions

- Before installation, please conduct a meticulous visual inspection. If the product is damaged or has obvious defects, do not continue to use it.
- This product is suitable for environments with a pollution degree of 2.
- The primary and secondary circuits of the switch power supply must have safety isolation. This overcurrent protector with 24 VDC can operate in a voltage environment up to 30 VDC and as low as 18 VDC.
- Do not use a maximum input/output current exceeding 40A. Please use a power supply with current limiting or an appropriate fuse for backup protection.
- Be sure to use correctly sized, high-temperature resistant cables to ensure the product can withstand the maximum input/output current as claimed.
- Be sure to connect the negative pole of the switch power supply to the IN- terminal to ensure the product's own power supply.

Factory preset

- Upon leaving the factory, all channels of the product are closed, and preset to the 10 A current setting.
- During the product debugging process, the required rated current setting can be adjusted using the corresponding knobs for each channel.

Button operating method

- You can operate the corresponding LED buttons for each channel to turn on, turn off, and reset the channel.
- You can long-press the DC OK corresponding LED button to select the option to shut down all channels with one click.
- After a power outage, when the product is powered on again, each channel will revert to the on or off setting it had before the power was cut.
- After a power outage, when the product is powered on again, each channel will revert to the most recent current setting.

Rated current presetting method

- With the device turned off, set the nominal current using the current selection switch. The LED will start flashing red/green.
- Long press the LED button for 1 second to save the new current setting.
- After the channel is turned on, the following situations may occur: channel tripping (actual current exceeds the tripping value for the current channel setting), LED flashing red (actual current is in the low channel overload state), LED flashing yellow (actual current exceeds the warning value for the current channel setting), and LED flashing green (actual current is below 80 % of the current channel setting).
- If the LED flashes yellow/red, please reselect an appropriate setting and confirm the settings again.

Selecting the correct rated current setting method in the On State

- With the device turned on, set the channel current level to 10 A.
- Rotate the channel current knob to change the system current setting, gradually selecting levels from high to low, during which the channel LED will flash green.
- If the LED starts to flash yellow/green alternately at a certain level, it indicates that the current channel current level is set too low. Please turn the knob back to select a higher current level.
- Long press the LED button for 1 second to save the new current level.

Standards and Certification		
Standard certification	Reference standards	EN IEC 60068-2-6, EN IEC 60068-2-27, EN IEC 60068-2-78, EN IEC 61000-6-1, EN IEC 61000-6-2, EN IEC 61000-6-3, EN IEC 61000-6-4, UL2367, UL508
	Certification	CE, UL*

*UL approval has been submitted and will be completed shortly.