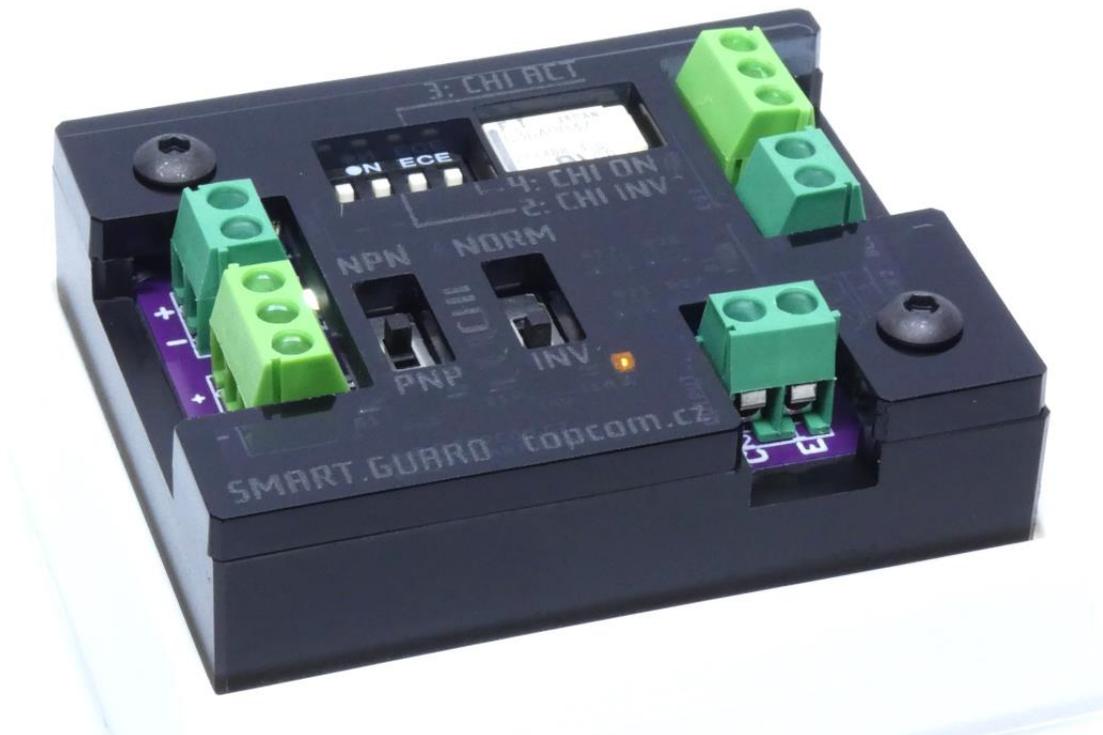


## SMART.GUARD – signal converter with probe guard function



Buy this item at:



<https://www.topcom.cz/store>

--- or ---



<https://www.ebay.com/str/cncprobes>



**Important: this device needs connection and installation. Seller does not take any responsibility for any damage or injury caused by using of this device. Read carefully documentation for your CNC machine and motion board.**

## Description:

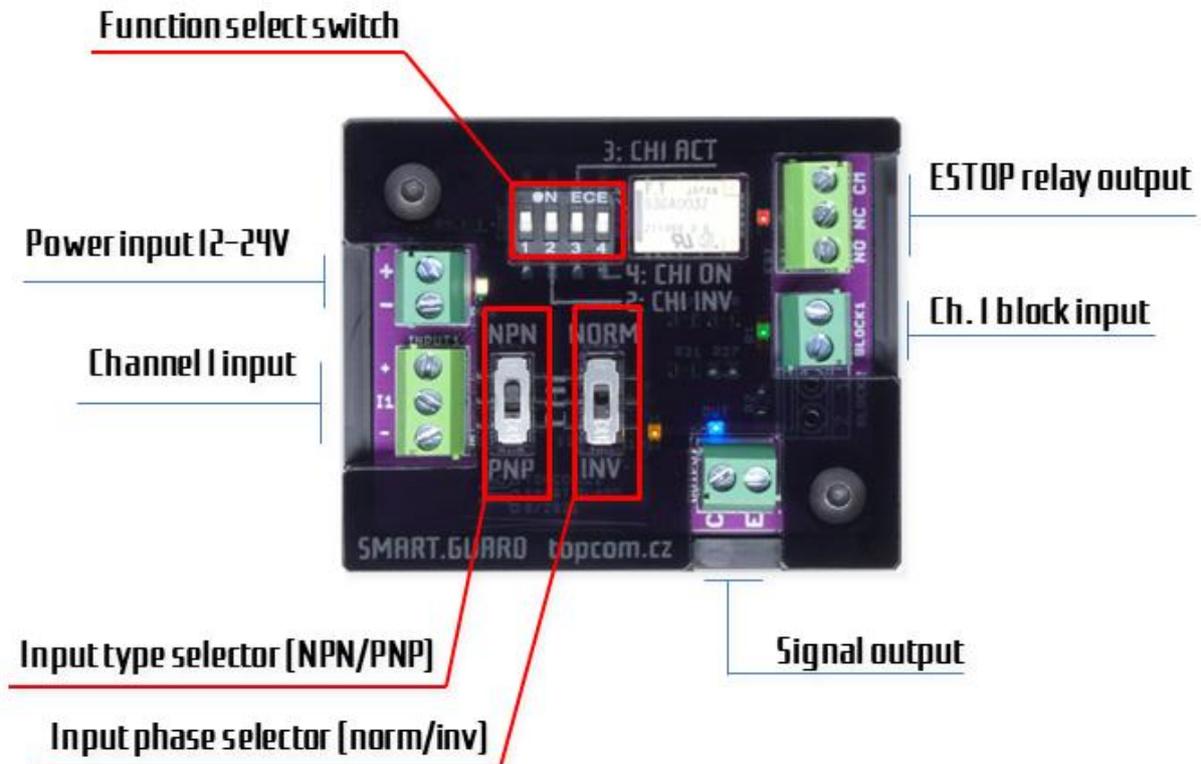
SMART.GUARD is a device, allows protecting your probe or TLS against unexpected triggering. It helps to prevent crash or damage.

SMART.GUARD is able to generate ESTOP signal, when connected probe is triggered in the unexpected moment.

## Main features:

POWER	
Power voltage (Vcc)	12-24V DC
Power consumption	<100mA
SIGNAL INPUTS	
Input current	4.5mA @ Vcc=12V 9.5mA @ Vcc=24V
Input polarity	NPN/PNP
SIGNAL OUTPUT	
Output type	Opto-isolated transistor
Output voltage	24V max.
Output current	20mA max.
Output phase	NORMAL/INVERTed
Transitional ON time	<20us
Transitional OFF time	<500us
ESTOP OUTPUT	
Output type	Relay
Output voltage	50V max.
Output current	100mA max.
BLOCK INPUT	
Input voltage	5-24V
Input polarity	any
DIMENSION	
Width x Height	55.5x45.3mm

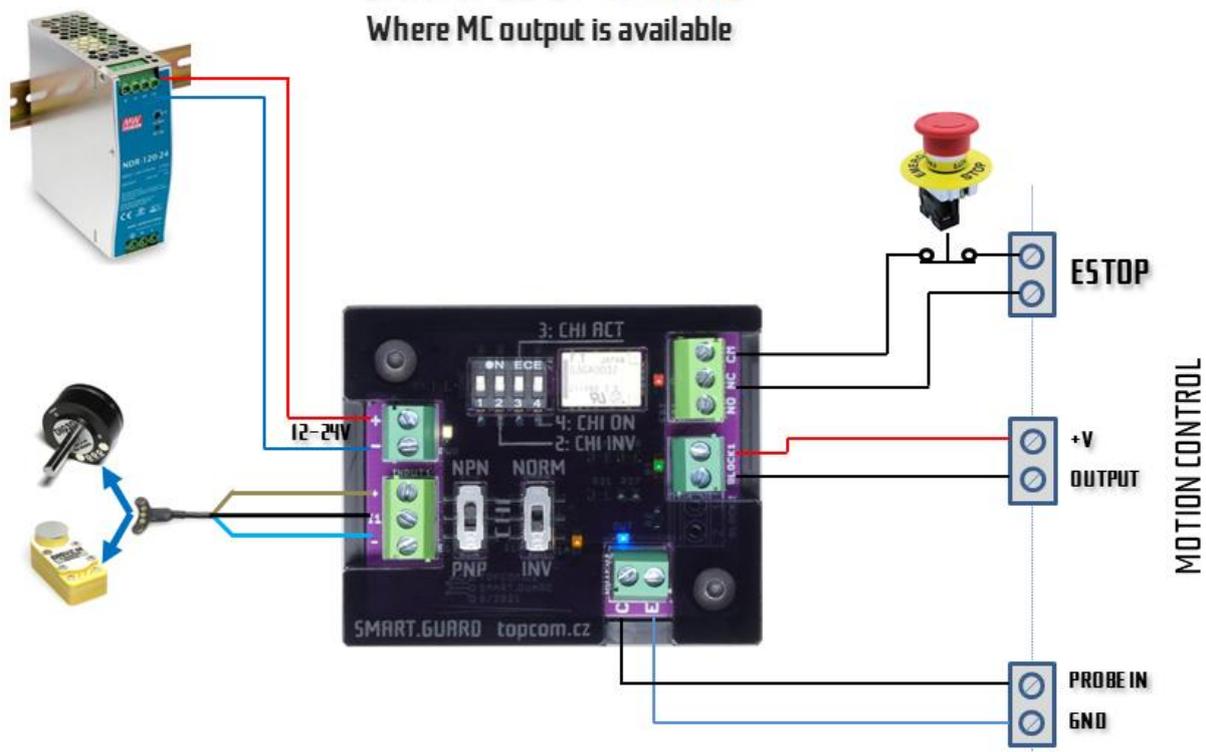
## Description:



- **Power input**: 12-24V/100mA max power input
- **Channel input**: signal input for a sensor connection
- **ESTOP relay output**: dry contact – ESTOP circuit connection
- **Channel 1 block input**: input blocks guard function
- **Signal output**: optically-isolated transistor output of a signal
- **Function select switch**: enable/disable the guard function and probe detect function
- **Input type selector**: allows setup the input polarity (NPN/PNP)
- **Input phase selector**: allows setup the input phase (normal/inverted)

## EXAMPLE OF WIRING

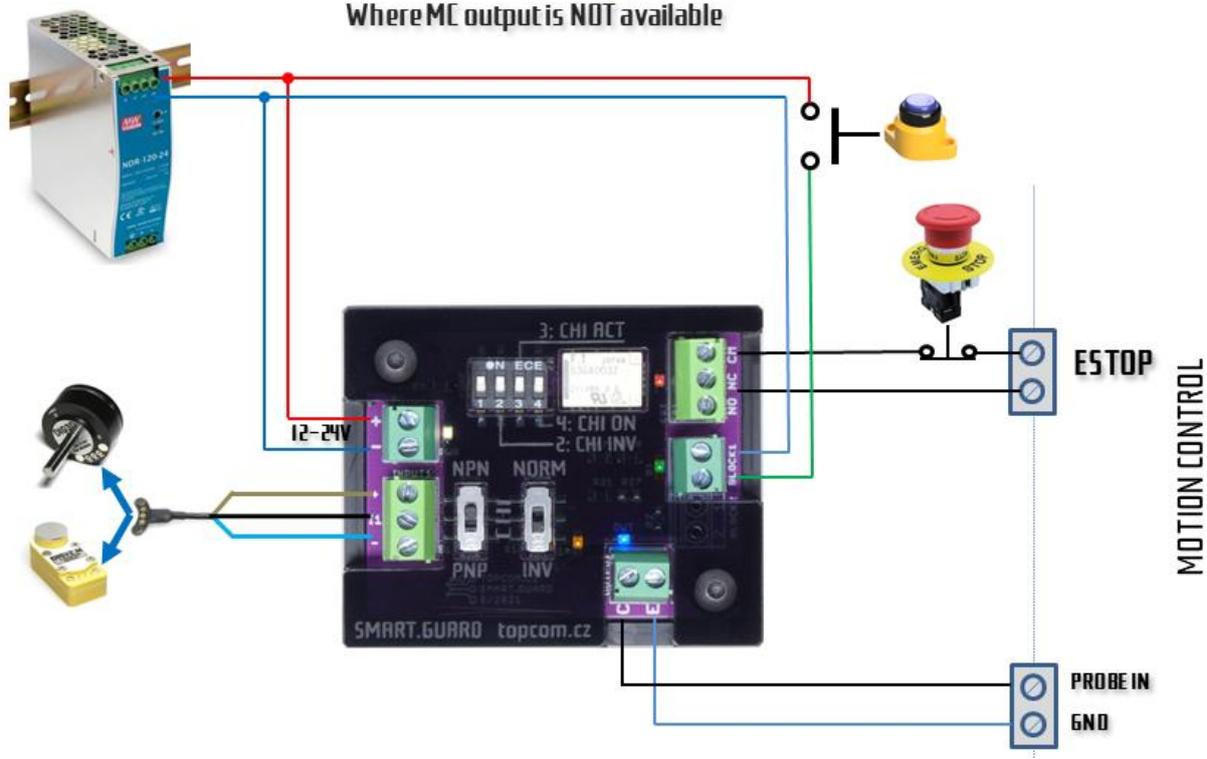
Where MC output is available



Typical wiring when output from a motion control is available. Some of motion control software (like MACH3, MACH4 etc.) allow modification of a probing script. Free motion control board output can be connected to SMART.GUARD block input, to activate guard function block by a script command.

## EXAMPLE OF WIRING

Where MC output is NOT available



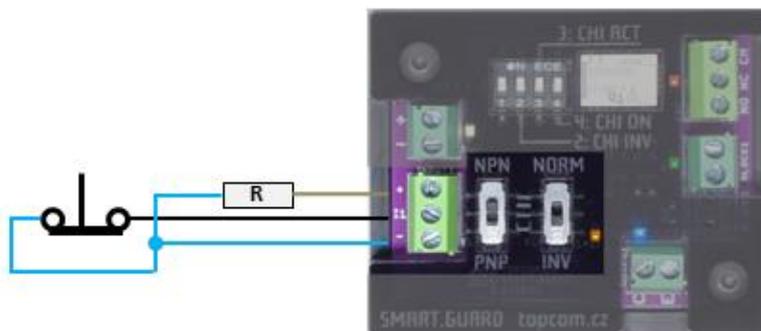
If there is no free output on a motion control board or it is not possible to modify the probing script in the motion software, block input should be activated by a button.

Button is pressed manually when probing is allowed. It blocks the guard function during probing process.

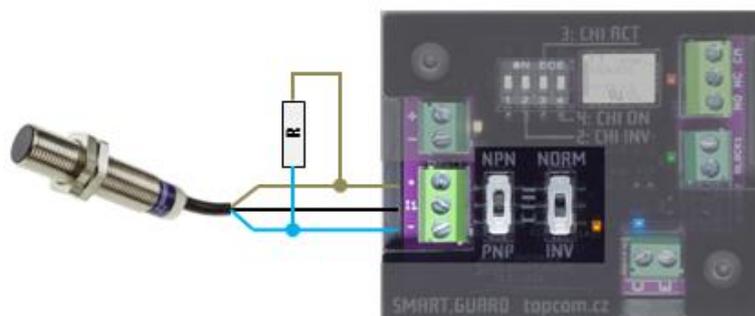
## Input channels:



Connection of simple switch. Function “probe connected detection” is not used. Channel is permanently enabled.



When you want to use “probe connected detection” with simple switch, it is necessary add a resistor in between power line and GND. Resistor value is ca 1.2kOhm in case of 12V power supply, and 2.4kOhm in case of 24V power supply.



When a sensor has not enough current consumption to activate the channel, it is possible to add a resistor. Resistor value is ca 1.2kOhm in case of 12V power supply, and 2.4kOhm in case of 24V power supply.

- **Input terminal:**

- + ... sensor power
- In ... input clamp
- ... sensor GND

- **Input type switch:**

**NPN** ... input is configured for NPN output from a sensor (switching to -)

**PNP** ... input is configured for PNP output from a sensor (switching to +)

- **Input phase:**

**NORM** ... output is active, if input is activated (for NO sensors)

**INV** ... output is active, if input is inactive (for NC sensors)

- **Indicator – probe connected:**

**YELLOW** LED is lighting, when a probe is connected.

Probe connection is detected, when a current consumption is higher than 8mA.

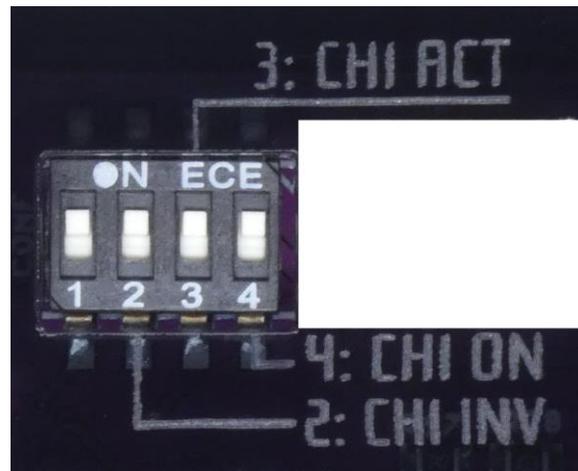


**If you need to connect passive switch and want to use „probe detection“ function, it is possible to simulate sensor power consumption by a resistor connected in between +power line and GND.**

**Resistor value should be:**

- **2,4kOhm for 24V power supply**
- **1,2kOhm for 12V power supply**

## Function configuration switch:



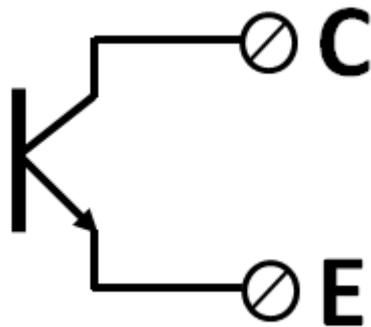
- 1: not used
- 2: **CH1 INV**: ON – ESTOP generated on falling edge of an input signal  
OFF – ESTOP generated on rising edge of an input signal
- 3: **CH1 ACT**: ON – channel 1 is always ON, OFF – channel 1 uses probe detection function
- 4: **CH1 ON**: ON – channels 1 generated ESTOP, OFF – probe guard is disabled for channel 1



- **Status indicator:**

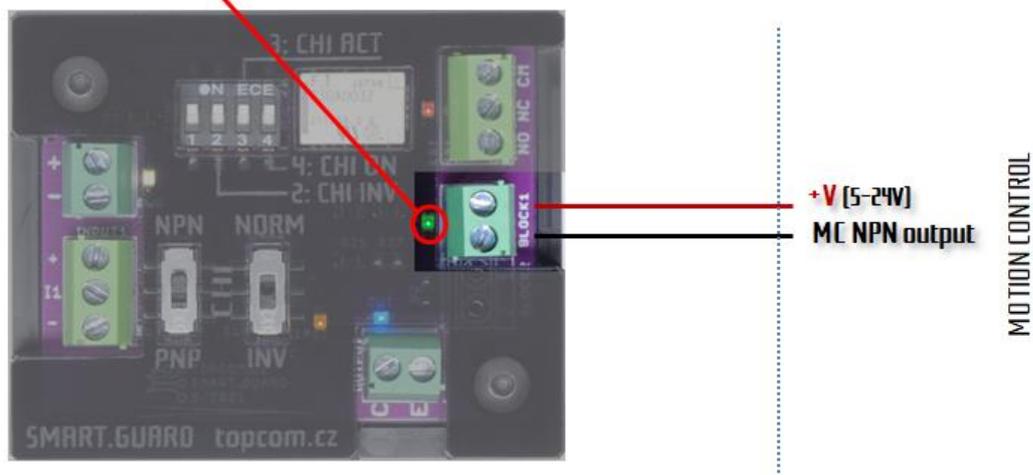
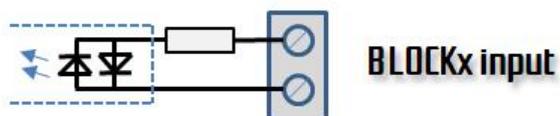
LED is lighting, when output is active.

- **Output terminal:**



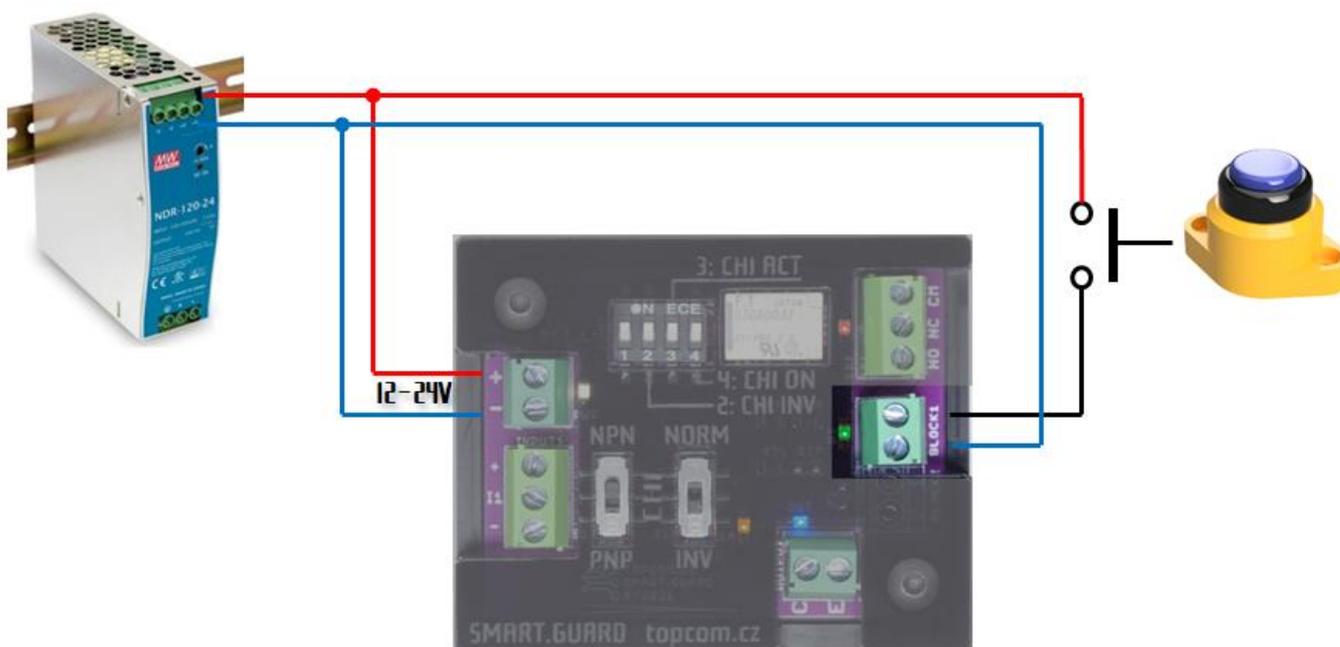
## Block input:

Indicator: block input active



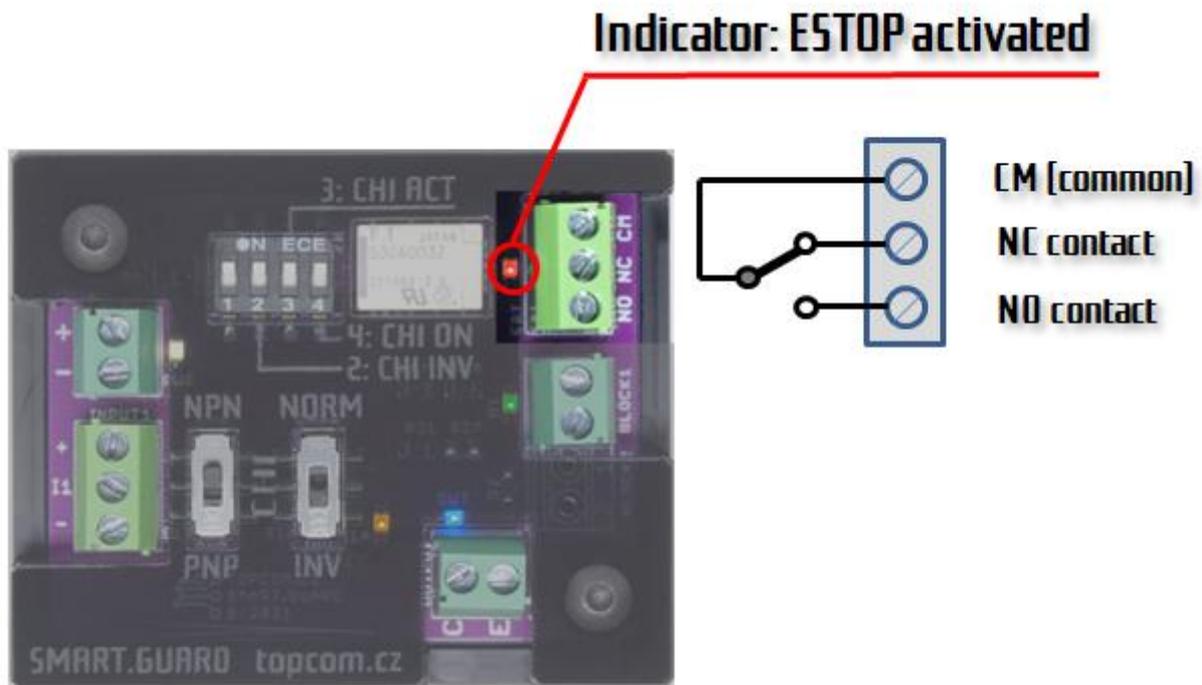
Block1 input is used for blocking of the probe guard function.

Input is potential-free, activated by applied voltage in between 5-24V, in any direction.



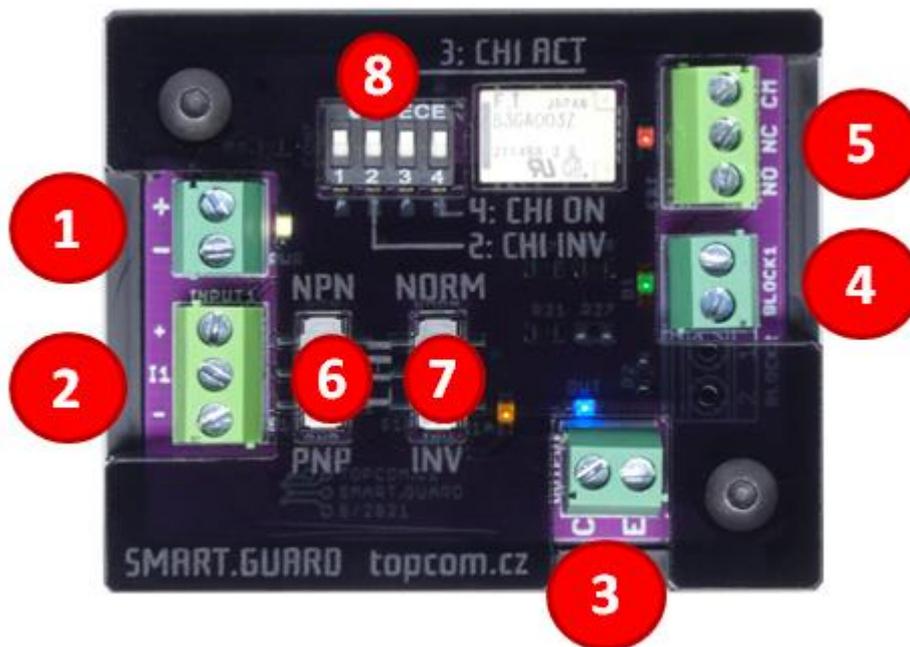
If a motion control output is not available, block input can be driven also by NO switch.

## ESTOP output:



ESTOP output is potential-free contact and must be connected to estop circuit of a machine.

## Board setup procedure:



1. Connect the power source (12-24V).
2. Connect the sensor or switch to the input.
3. Connect the output to the motion control board.
4. Connect the block input to the motion control board output, or to the button.
5. Connect ESTOP output to the e-stop circuit of your machine.
6. Set the correct input type (NPN/PNP) by IIT switch:
  - If the input type is set correctly, output LED reacts to the sensor triggering.
7. Set the correct input signal phase by IIP switch
8. Set the function switch.