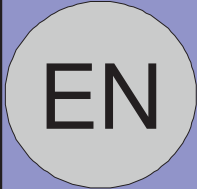


K Series - Converters & Interfaces



K111

Dual output frequency trip amplifier
for on/off sensors

Overall description

The K111 is a dual output isolated trip amplifier/converter for specific on/off sensors, also featuring input repeater and frequency divider. The input stage is adjustable to almost every kind of sensor type, and it is provided with an isolated stabilized supply, that makes it suitable both for 2 and 3 wire devices. The module has to be PC programmed through S117P interface, both for output and led functions. Outputs are strong, internally protected PNP type. Maximum frequency is 20 kHz.

Key features

HW

- ✓ Dual output frequency trip amplifier/converter and divider till 256.
- ✓ Built-in isolated, protected and stabilized power supply at sensor side.
- ✓ Pulse input for all the most common sensors: mechanical contact, IEC1131, NAMUR, 2 or 3 wire NPN/PNP with 12 V or 22 V, Reed, photo-transistor and Hall (AICHI) devices.
- ✓ Two free programmable 200 mA PNP outputs, internally protected.
- ✓ 1500 V galvanic isolation between input and output side.
- ✓ Threshold, hysteresis, window and invert output function.
- ✓ Customized PC software and USB programming interface (S117P).
- ✓ Also support out-board programming without supply.
- ✓ Frequency up to 20 kHz and N-counts averaging window ($N \leq 256$).
- ✓ Also usable as input repeater or inverter.
- ✓ Two programmable and power supply indicator front leds.
- ✓ Programmable filter for false-frequency rejecting.
- ✓ Input setting by four dip-switches.
- ✓ Spring terminal series K case, with SMART SUPPLY system.

Technical features

POWER SUPPLY


Terminals	M7 (+), M8 (-) or back side bus
Voltage	19.2–30 V _{DC}
Consumption @ 24 V	- With 2 wire input devices: < 23 mA - With 3 wire input devices, supplying 20 mA: < 40 mA
INPUT	
Terminals	M1 (S _{S+}), M2 (PNP _{IN}), M3 (NPN _{IN}), M4 (S _{S-})
Input type	Mechanical contact, per std. IEC1131.2 type 1, NAMUR (DIN19234, EN60947-5-6), 2/3 wire NPN o PNP (12 or 22 V), Reed, photo, AICHI devices.
Switching threshold	- M2 (NAMUR, std, PNP): ~1.6 mA - M3 (std, NPN): ~3 mA
Hysteresis	~0.2 mA
Max current	- M2 (NAMUR): ~8 mA - M2 (std, PNP): ~3.6 mA - M3 (std, NPN): ~5 mA
Frequency range	DC, 1/36 h .. 20 kHz
Min active time	10 μs
Max voltage	±28 V

SENSOR POWER SUPPLY

Available voltages	8 ± 0.6 V, 12 ± 1 V and 22 ± 2 V
Internal source impedance	- NAMUR: ~1 kΩ - Photo: ~1 kΩ - M1-M4 (Sensor power supply): ~40 Ω
3 wire devices current (M1-M4)	- Max continuous current : 22 mA - Short circuit current: ~35 mA (peak ~500 mA)

OUTPUT

Function	Input repeater, threshold, window, divider, fixed, invert.
Terminals	- M6: Programm. output 1 PNP “source” (close to positive M7) - M5: Programm. output 2 PNP “source” (close to positive M7)
Max current	200 mA (each output)
Protection	Self-restoring fuse
Max voltage	-30 V continuous, -50 V peak

OPERATING CONDITION	
Protection index	IP20
Temperature	-10..+65 °C
Storage temperature	-40..+85 °C
Humidity	10..90 % non-condensing
Altitude	Up to 2000 m a.s.l.
INDICATION	
Green led	Power supply (enough voltage)
2 Red leds	Programmable (input, output, threshold, fixed, inverted)
CASE	
Connection	Spring type terminals
Conductor section	0.2..2.5 mm ²
Wire stripping	~8 mm
Dimension & weight	93.1 x 102.5 x 6.2 mm; 45 g
Box material	PBT, black
STANDARDS / ISOLATION	
I/O isolation	2 points, 1500 V _{AC} , 1 min.
Standards	EN61000-6-4/2007 (electromagnetic emission, industrial) EN64000-6-2/2005 (electromagnetic immunity, industrial) EN61010-1/2001 (safety). All circuits must be provided with double insulation from those sections at hazardous voltage. The power supply transformer must comply to EN60742 standard: "Insulation transformers and safety transformers".
	

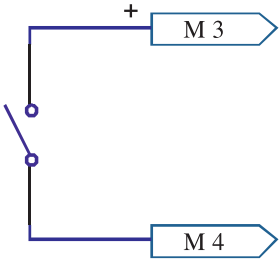
Mounting location

Assembly in vertical position is recommended in order to increase the module's ventilation, and no raceways or other objects that compromise aeration must be positioned nearby. Do not position the module above heat generating equipments; we recommend positioning the module in the lower part of the control panel or container compartment.

Accessories

Code	Description
K-BUS	Two slot back-side connector for K-series instrument power supply
K-SUPPLY	Redundant power supply module for K-series

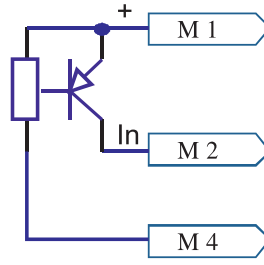
Contact according to IEC1131 - Type 1



Dip switches			
1	2	3	4
-	On	On	-

$V_s = 21 \pm 2 \text{ V}$
 $I_{sw} = 3 \text{ mA}, I_{max} = 5 \text{ mA}$

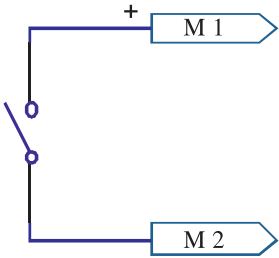
PNP 24 V (21 V)



Dip switches			
1	2	3	4
-	On	On	-

$V_s = 21 \pm 2 \text{ V}, I_s < 22 \text{ mA}$
 $I_{sw} = 1.6 \text{ mA}, I_{linMax} = 3.6 \text{ mA}$

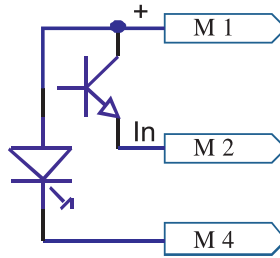
NAMUR



Dip switches			
1	2	3	4
On	On	-	On

$V_s = 8.0 \pm 0.6 \text{ V}$
 $I_{sw} = 1.6 \text{ mA}, I_{linMax} = 8 \text{ mA}$

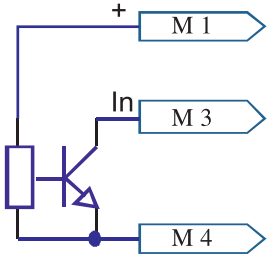
Photo



Dip switches			
1	2	3	4
-	-	On	-

$V_s = 21 \pm 2 \text{ V}, R_s = 1 \text{ k}\Omega$
 $I_{sw} = 1.6 \text{ mA}, I_{linMax} = 3.6 \text{ mA}$

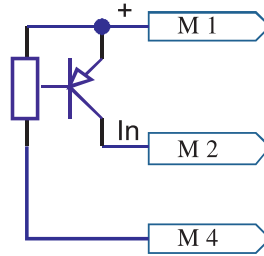
NPN 24 V (21 V)



Dip switches			
1	2	3	4
-	On	On	-

$V_s = 21 \pm 2 \text{ V}, I_s < 22 \text{ mA}$
 $I_{sw} = 3 \text{ mA}, I_{linMax} = 5 \text{ mA}$

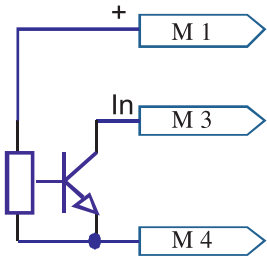
PNP 12 V



Dip switches			
1	2	3	4
-	On	-	On

$V_s = 12 \pm 1 \text{ V}, I_s < 22 \text{ mA}$
 $I_{sw} = 1.6 \text{ mA}, I_{linMax} = 3.6 \text{ mA}$

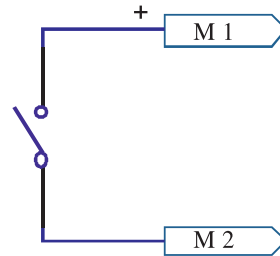
NPN 12 V



Dip switches			
1	2	3	4
-	On	-	On

$V_s = 12 \pm 1 \text{ V}, I_s < 22 \text{ mA}$
 $I_{sw} = 3 \text{ mA}, I_{linMax} = 5 \text{ mA}$

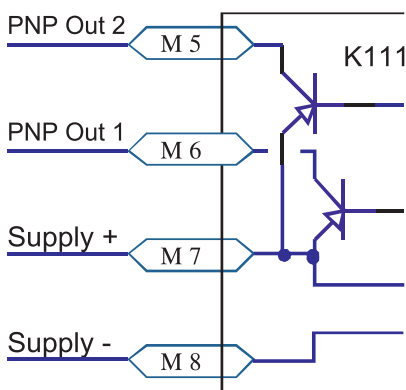
Reed (12 V)



Dip switches			
1	2	3	4
-	On	-	On

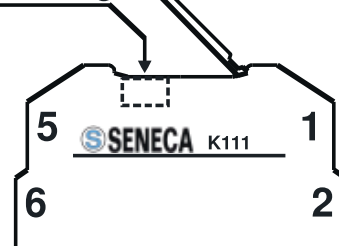
$V_s = 12 \pm 1 \text{ V}$
 $I_{sw} = 1.6 \text{ mA}, I_{linMax} = 3.6 \text{ mA}$

PNP Outputs



$I_{sw} = 200 \text{ mA max per channel}$
 $R_{sw} < 3 \Omega$ | $V_{sw} |_{max} = 50 \text{ V}$

Programmer Plug



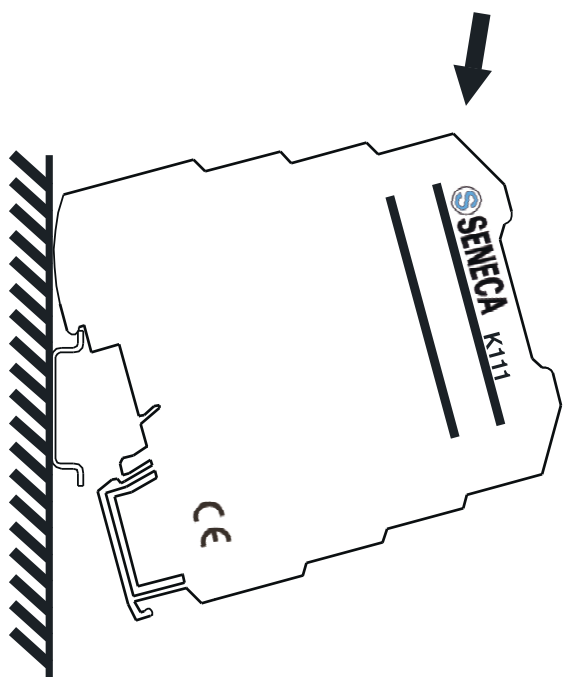
DIP-switches & Terminals

Switch				Terminal				Input type
1	2	3	4	M1	M2	M3	M4	
○	○		○	+	-			NAMUR 8 V (DIN19234, EN60947-5-6)
	○	○				+	-	Standard switch (IEC1131.2 type 1)
	○	○		+		S	-	NPN 21 V
	○	○		+	S		-	PNP 21 V
	○		○	+		S	-	NPN 12 V
	○		○	+	S		-	PNP 12 V
	○		○	+	-			Reed 12 V
		○		+	S		-	Photo

Mounting hints

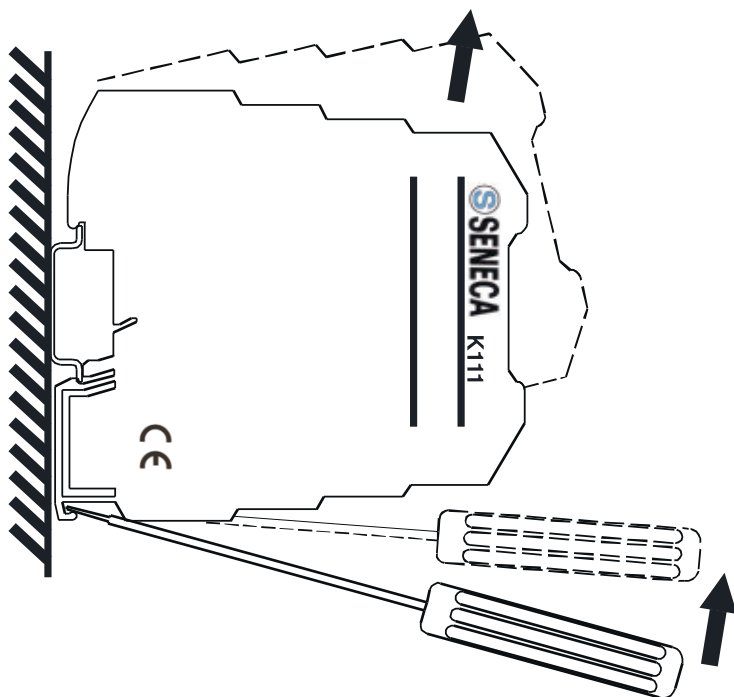
This module has been designed for assembly on a DIN 46277 rail:

Inserting the module in the rail:



- 1- Attach the module in the upper part of the rail.
- 2- Press the module downwards.

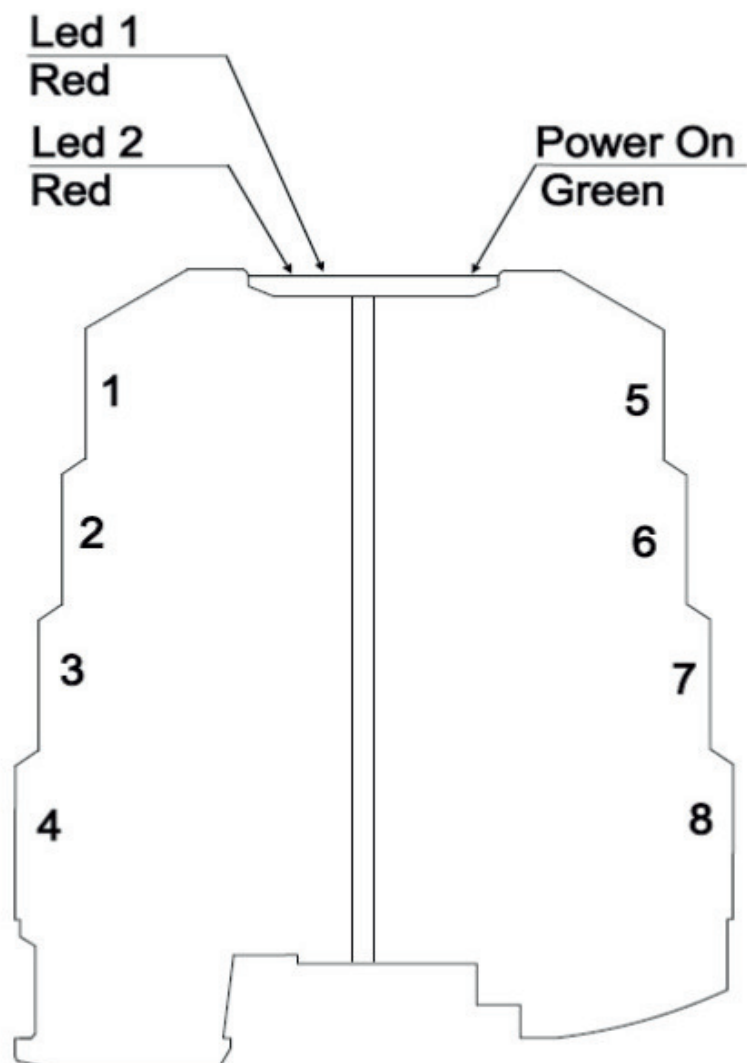
Removing the module from the rail:



- 1- Apply leverage using a screwdriver (as shown in the figure).
- 2- Rotate the module upwards.

LED status

LED	MEANING
POWER (green)	The module is power on
LED 1 (red)	LED1 is on if OUT1 is high. OUT1 behaviour depending on the programming output 1 status (see software Easy)
LED 2 (red)	LED2 is on if OUT2 is high. OUT2 behaviour depending on the programming output 2 status (see software Easy)





Disposal of Electrical & Electronic Equipment (Applicable throughout the European Union and other European countries with separate collection programs)

This symbol, found on your product or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of this product, please contact your local city office, waste disposal service or the retail store where you purchased this product.

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