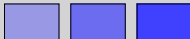




SENECA



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 on/off sensors, with input repeater. The input stage is configurable to almost every kind of sensor type and 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 S117P1 or EASY-USB interfaces, both for output and led functions. Outputs are high current, internally protected PNP type.

Key features

HW

- ✓ 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 and photo-transistor.
- ✓ 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 (S117P1 or EASY-USB).
- ✓ Also support out-board programming without supply.
- ✓ Frequency up to 20 kHz and N-counts averaging window ($N < 256$).
- ✓ Also usable as input repeater or inverter.
- ✓ Two programmable and power supply indicator front LEDs.
- ✓ Programmable filter for high-frequency rejecting.
- ✓ Input setting by four dip-switches.
- ✓ Spring terminal series K case, with SMART SUPPLY system.
- ✓ Dual output frequency trip amplifier-converter for digital inputs.

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 and photo.
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, 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 Electromagnetic emission, industrial environment. EN61000-6-2 Electromagnetic immunity, industrial environment. EN1010-1 Safety. All circuits must be provided with double insulation from those sections at hazardous voltage.

**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

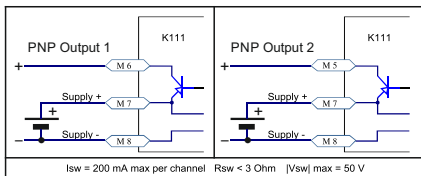
Code	Description
K-BUS	Two slot back-side connector for K-series instrument power supply
K-SUPPLY	Redundant power supply module for K-series

DIP Switches Input type configuration

Before setting the DIP switches you must disconnect the power supply.

INPUT: Contact according to IEC1131-Type1		INPUT: PNP 24V (21V)																									
	<table border="1" style="margin: auto;"> <tr><th colspan="4">DIP Switches setting</th></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td style="text-align: center;">↓</td><td style="text-align: center;">↑</td><td style="text-align: center;">↑</td><td style="text-align: center;">↓</td></tr> </table> <p style="text-align: center;">$V_s = 21 \pm 2 V$, $I_{sw}=3 mA$, $I_{max}=5 mA$</p>	DIP Switches setting				1	2	3	4	↓	↑	↑	↓		<table border="1" style="margin: auto;"> <tr><th colspan="4">DIP Switches setting</th></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td style="text-align: center;">↓</td><td style="text-align: center;">↑</td><td style="text-align: center;">↑</td><td style="text-align: center;">↓</td></tr> </table> <p style="text-align: center;">$V_s = 21 \pm 2 V$, $I_s < 22 mA$ $I_{sw}=1.6 mA$, $I_{linmax}=3.6 mA$</p>	DIP Switches setting				1	2	3	4	↓	↑	↑	↓
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INPUT: NAMUR		INPUT:Photo																									
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INPUT: NPN 24V(21V)		INPUT: PNP 12V																									
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INPUT: NPN 12V		INPUT: Reed (12V)																									
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DIP Switches setting																											
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KEY		ON	KEY																								
		OFF																									
Switches		Terminals		DIP-Switches & Terminals setting																							
1	2	3	4	M1	M2	M3	M4	Input type (S = detector)																			
↑	↑	↓	↑	+	-			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																			

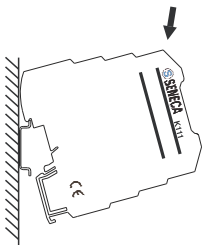
PNP Outputs



Mounting hints

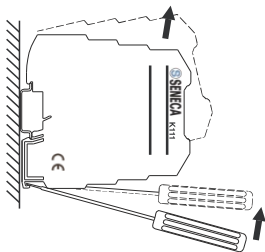
This module has been designed for assembly on a DIN 46277 rail:

Inserting the module in the rail:



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

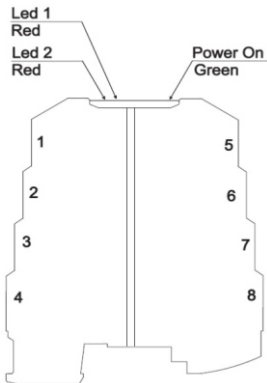
Removing the module from the rail:



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

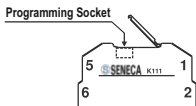
LED status

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)



Programming procedure

Connect the EASY-USB or S117P1 interface to the module Programming Socket.



Please configure the module with the dedicated software. We suggest the last version of EASY-SETUP software downloadable from the website: www.seneca.it.

When the configuration is done, the connection cable must be disconnected in order to power off the module.

Now you can set the input type through the DIP-switches, with the module turned off. When restarted, the module loads the new configuration.

Cutoff filter

The module has a low-pass filter that prevents the passage of high frequency disturbances.

The cutoff frequency of the filter can be set during the configuration process.



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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