

INSTALLATION MANUAL

K111D

Dual insulated output frequency divider and repeater



 **SENECA**



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Manuals and configuration software are available at website: www.seneca.it/products/k111d

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MODULE DESCRIPTION

K111D is a dual output galvanic insulated frequency divider for specific ON / OFF sensors, with input repeater function.

The input section allows many adjustment options and has an isolated stabilized power supply, that makes it suitable for 2 and 3-wire sensors.

The module is PC configurable through S117P1 or EASY-USB interfaces, it has three LED on frontal panel and internally protected PNP outputs with high-current.

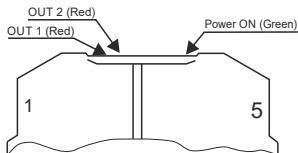
GENERAL CHARACTERISTICS

- Input frequency divider up to 256.
- The device allows outputs configuration as divider or repeater.
- Isolated, stabilized and protected sensor side power supply.
- The device allows pulse input from the most common types of sensor: mechanical contact, IEC1131, NAMUR, Reed, photocell and two or three NPN / PNP wires with 12 V or 22 V voltages.
- Two configurable PNP outputs up to 200 mA, shot-circuit protected.
- 1500 V galvanic insulation between input and two outputs.
- Dedicated PC software and custom programming interface (Optional S117P1 / EASY USB).
- The device allows out-board programming when not powered.
- Frequency up to 20 kHz.
- A LED indicates the power supply presence and two LEDs, the outputs status.
- Programmable input filter with adjustable frequency.
- Input setting through 4 DIP-Switches.
- Spring terminals K case with SMART SUPPLY system.

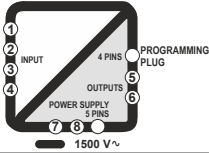
LED SIGNALLING ON FRONT PANEL

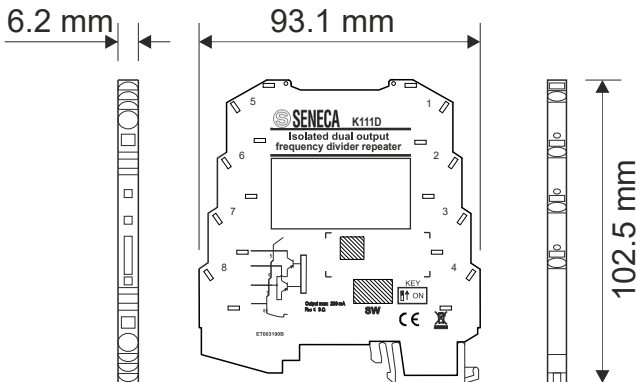
LED	Status	LED's meaning
PWR (Green)	ON	Power supply presence
	OFF	Device is powered off
LED1 (Red)	ON	Output 1 state is HIGH
	OFF	Output 1 state is LOW
LED2 (Red)	ON	Output 2 state is HIGH
	OFF	Output 2 state is LOW

LEDs position



TECHNICAL SPECIFICATIONS

STANDARDS	EN61000-6-4 Electromagnetic emission, industrial environment EN61000-6-2 Electromagnetic immunity, industrial environment EN61010-1 Safety
INSULATION	
ENVIRONMENTAL COND.	Temperature -20 – + 65°C. Humidity 30% – 90% not condensing. Storage temperature -20 – + 85°C. Protection degree IP20.
MOUNTING	IEC EN60715 DIN rail.
CONNECTIONS	8 spring terminals for 0.2 – 2.5 mm ² cable, suggested cable stripping about 8 mm, 1 rear K-BUS 5 pins connector.
COMMUNICATION PORT	1 Frontal panel configuration connector 4 pins step 2.54 mm



Dimension (L×H×P)	6.2 x 102.5 x 93.1 mm
Weight	50 g.
Case	Material PBT, black color.

TECHNICAL SPECIFICATIONS

POWERSUPPLY	M7 (+) and M8 (-) or rear K-BUS
<i>Terminals</i>	19.2 – 30 V $\overline{\text{=}}$
<i>Voltage</i>	Max. 23 mA at 24 V with 2 wires input devices.
<i>Absorbed current</i>	Max. 40 mA at 24 V with 3 wires input devices.
DIGITAL INPUT	M1 (S _s), M2 (PNP _{IN}), M3 (NPN _{IN}), M4 (S _s) mechanical contact, contact according to IEC1131.2 type 1, NAMUR DIN 19234, EN60947-5-6, two and three NPN / PNP wires with 12 V or 22 V voltages, Reed and photocell.
<i>Terminal</i>	M2 (NAMUR, std, PNP): about 1.6 mA.
<i>Input type</i>	M3 (std, NPn): about 3 mA.
<i>Switching threshold</i>	about 0.2 mA.
<i>Hysteresis</i>	M2 (NAMUR): about 8 mA.
<i>Max. current</i>	M2 (std, PNP): about 3.6 mA.
<i>Frequency range</i>	M3 (std, NPn): about 5 mA.
<i>Min. active time</i>	DC (0 Hz) – 20 kHz.
<i>Max. voltage</i>	10 μ s.
SENSOR POWER SUPPLY	8 \pm 0.6 V, 12 \pm 1 V, 22 \pm 2 V.
<i>Available voltages</i>	NAMUR: about 1k Ω .
<i>Internal source impedance</i>	Photocell: about 1k Ω .
<i>3 wires current</i>	M1 – M4 (sensor power supply): about 40 Ω .
<i>(M1 –M4)</i>	Max. continuous current: 22 mA.
DIGITAL OUTPUT	Short-circuit current: about 35 mA (peak 500 mA).
<i>Type</i>	Input divider or repeater.
<i>Terminals</i>	M6: programmable output 1 PNP «source» (connect to positive M7).
<i>Max. current</i>	M5: programmable output 2 PNP «source» (connect to positive M7).
<i>Protection</i>	200 mA (each output).
<i>Max. voltage</i>	Self-restoring fuses.
	-30 V continuous, -50 V peak.

PRELIMINARY WARNINGS



Before performing any operation is mandatory to read the full contents of this manual. The module may only be used by qualified and skilled technicians in the field of electric installation. Specific documentation is available for download at website: www.seneca.it/products/k111d.



Only the Manufacturer is authorized to repair the module or to replace damaged parts. The product is susceptible to electrostatic discharge, take appropriate countermeasures during any operation.

PRELIMINARY WARNINGS



No warranty is guaranteed in connection with faults resulting from improper use, from modifications or repairs carried out by Manufacturer-unauthorized personnel on the device, or if the content of this user Manual is not followed.



Disposal of electrical & electronic equipment (applicable throughout the EU and other countries with separate collection programs). The symbol found on this product or on its packaging, indicates that this product it must be handed over to an applicable collection point for **the recycling of electrical and electronic equipments**.

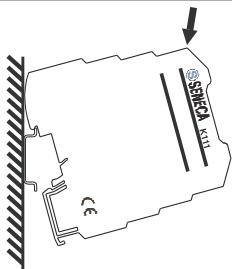
INSTALLATION RULES

In order to ensure optimum performance and a longest working life, the module(s) must be provided with adequate ventilation and no raceways or other objects that obstruct the ventilation slots.

Never install the modules near heat sources.

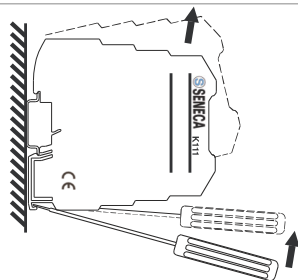
We recommend installation in the lower part of the control panel.

INSTALLATION ON AND REMOVAL FROM IEC EN 60715 DIN RAIL



Insertion into the IEC EN 60715 DIN rail:

- 1) Hook the module at the upper side of the rail as shown in the picture.
- 2) Press the module downwards as shown by the arrow.



Removal from IEC EN 60715 DIN rail:

- 1) Apply leverage with a screwdriver as shown in the picture
- 2) Turn the module upwards as shown by the arrow and extract the module from the rail.

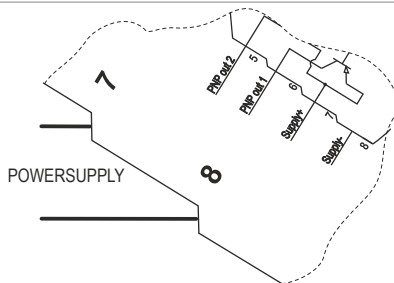
ELECTRICAL CONNECTIONS



In order to satisfy the electromagnetic compliance requirements:

- Use shielded cables for the signals transmission.
- Connect the shield to a preferential ground for devices.
- Space the shielded cables from other cables used for power installations. (transformers, inverters, motors, induction ovens, etc...).

• POWERSUPPLY



In addition to terminals 7 and 8, the power supply can also be supplied by the five-pole rear connector that through the K-BUS accessory allows connection to the power supply K-SUPPLY

• DIGITAL INPUT

Type	Connection	Configuration																				
Contact according to IEC1131 - Type 1 $V_s = 21 \pm 2 \text{ V}$ $I_{sw} = 3 \text{ mA}$ $I_{inmax} = 5 \text{ mA}$		<table border="1"> <thead> <tr> <th colspan="4">DIP SWITCHES</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td></td> <td>↑</td> <td>↑</td> <td></td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">KEY</th> </tr> <tr> <td>☐ ↑</td> <td>☐ ↓</td> </tr> <tr> <td>↑</td> <td></td> </tr> <tr> <td>ON</td> <td>OFF</td> </tr> </thead> </table>	DIP SWITCHES				1	2	3	4		↑	↑		KEY		☐ ↑	☐ ↓	↑		ON	OFF
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	↑	↑																				
KEY																						
☐ ↑	☐ ↓																					
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ON	OFF																					
NAMUR $V_s = 8.0 \pm 0.6 \text{ V}$ $I_{sw} = 1.6 \text{ mA}$ $I_{inMax} = 8 \text{ mA}$		<table border="1"> <thead> <tr> <th colspan="4">DIP SWITCHES</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>↑</td> <td>↑</td> <td></td> <td>↑</td> </tr> </tbody> </table>	DIP SWITCHES				1	2	3	4	↑	↑		↑								
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Reed (12 V) $V_s = 12 \pm 1 \text{ V}$ $I_{sw} = 1.6 \text{ mA}$ $I_{inMax} = 3.6 \text{ mA}$		<table border="1"> <thead> <tr> <th colspan="4">DIP SWITCHES</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td></td> <td>↑</td> <td></td> <td>↑</td> </tr> </tbody> </table>	DIP SWITCHES				1	2	3	4		↑		↑								
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ELECTRICAL CONNECTIONS

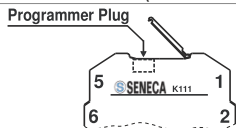
Type	Connection	Configuration																				
NPN 24 V (21 V) $V_s = 21 \pm 2 \text{ V}$ $I_s < 22 \text{ mA}$ $I_{sw} = 3 \text{ mA}$ $I_{inmax} = 5 \text{ mA}$		<table border="1"> <thead> <tr> <th colspan="4">DIP SWITCHES</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td></td> <td>↑</td> <td>↑</td> <td></td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">KEY</th> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>↑</td> <td></td> </tr> <tr> <td>ON</td> <td>OFF</td> </tr> </thead> </table>	DIP SWITCHES				1	2	3	4		↑	↑		KEY				↑		ON	OFF
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NPN 12 V $V_s = 12 \pm 1 \text{ V}$ $I_s < 22 \text{ mA}$ $I_{sw} = 3 \text{ mA}$ $I_{inMax} = 5 \text{ mA}$		<table border="1"> <thead> <tr> <th colspan="4">DIP SWITCHES</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td></td> <td>↑</td> <td></td> <td>↑</td> </tr> </tbody> </table>	DIP SWITCHES				1	2	3	4		↑		↑								
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Photo $V_s = 21 \pm 2 \text{ V}$ $R_s = 1 \text{ k}\Omega$ $I_{sw} = 1.6 \text{ mA}$ $I_{inmax} = 3.6 \text{ mA}$		<table border="1"> <thead> <tr> <th colspan="4">DIP SWITCHES</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>↑</td> <td></td> </tr> </tbody> </table>	DIP SWITCHES				1	2	3	4			↑									
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• DIGITAL OUTPUTS

PNP $ V_{sw \text{ Max.}} = 50 \text{ V}$ $R_{sw} < 3 \Omega$ $I_{sw \text{ Max.}} = 200 \text{ mA}$ each channel	
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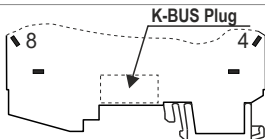
COMMUNICATION PORTS

• PROGRAMMER PLUG (ON FRONTAL PANEL)



K111D has a 4 pins frontal port for device configuration, as shown in the picture.

• REAR PORT



K111D has a 5 pins rear connector, for module power supply, that allows connection to K-SUPPLY through K-BUS accessory.

DIP-SWITCHES CONFIGURATION

SWITCH		TERMINAL				INPUT TYPE		
1	2	3	4	M1	M2	M3	M4	
↑	↑		↑	+	-			NAMUR 8V (DIN19234, EN60947-5-6)
	↑	↑				+	-	Standard switch (IEC1131.2 type1)
	↑	↑		+		S	-	NPN 21V
	↑	↑		+	S		-	PNP 21V
	↑		↑	+		S	-	NPN 12V
	↑		↑	+	S		-	PNP 12V
	↑		↑	+	-			Reed 12 V
		↑		+	S		-	Photocell
KEY								
↑		ON						
		OFF						

ORDER CODES

Code	Description
K-BUS	Support with two slot for rear K-BUS connector of K devices.
K-SUPPLY	Redundant power supply module for K-devices.
EASY USB	USB-UART TTL converter with CD and programming software.
S117P1	USB-RS232-TTL-RS485 converter.

CONTACTS

Technical support	support@seneca.it	Product Informations	sales@seneca.it
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