

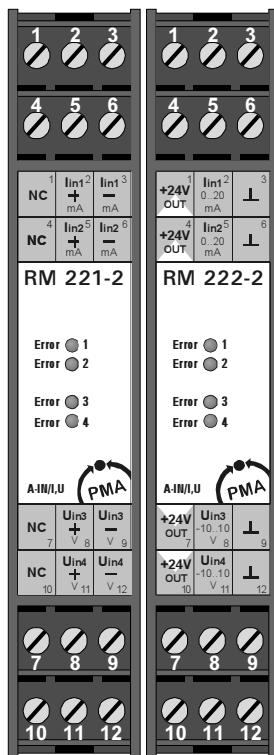


# Analog Input Module RM 221 / 222

## Safety Instructions

 <b>ESD !</b> <ul style="list-style-type: none"> <li>• contains electrostatically sensitive components</li> <li>• Original packing protects against electrostatic discharge (ESD)</li> <li>• Transporting only in the original packing</li> <li>• during mounting rules for protection against ESD must be followed</li> </ul>	 <b>Connections</b> <ul style="list-style-type: none"> <li>• Wiring must be conform to local standards (e.g. VDE 0100 in Germany) !</li> <li>• Input leads must be kept separate from signal and mains leads !</li> <li>• The protective earth must be connected to the relevant terminal (in the instrument carrier) !</li> <li>• The cable screening must be connected to the terminal for grounded measurement !</li> <li>• Usage of twisted and screened input leads prevent stray electric interference !</li> <li>• Connections must be made according to the connecting diagrams !</li> </ul>	 <b>Maintenance / Repair</b> <p>Instrument needs no particular maintenance.</p> <p><b>!</b> When opening the instrument live parts or terminals can be exposed. Before carrying out the instrument must be disconnected from all voltage sources. The instrument contains electrostatically sensitive components. The following work may be carried out only by trained, authorized persons.</p> <p><b>Fuse tripped:</b></p> <ul style="list-style-type: none"> <li>• Cause must be determined and removed !</li> <li>• Only fuses of the same type and current rating as the original fuse must be used.</li> <li>• Using repaired fuses or short-circuiting the fuse socket is inadmissible !</li> </ul>
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## Pin Assignment



Pin	RM221-0	RM221-1	RM221-2	RM222-0	RM222-1	RM222-2
1				24 V OUT	5/24 V OUT	24 V OUT
2	0...20 mA+	-10...10 V+	0...20 mA+	0...20 mA	-10...10 V	0...20 mA
3	0...20 mA-	-10...10 V-	0...20 mA-	GND	GND	GND
4				24 V OUT	5/24 V OUT	24 V OUT
5	0...20 mA+	-10...10 V+	0...20 mA+	0...20 mA	-10...10 V	0...20 mA
6	0...20 mA-	-10...10 V-	0...20 mA-	GND	GND	GND
7				24 V OUT	5/24 V OUT	5/24 V OUT
8	0...20 mA+	-10...10 V+	-10...10 V+	0...20 mA	-10...10 V	-10...10 V
9	0...20 mA-	-10...10 V-	0...20 mA-	GND	GND	GND
10				24 V OUT	5/24 V OUT	5/24 V OUT
11	0...20 mA+	-10...10 V+	-10...10 V+	0...20 mA	-10...10 V	-10...10 V
12	0...20 mA-	-10...10 V-	-10...10 V-	GND	GND	GND
Art.-Nr.	9407-738-22101	9407-738-22111	9407-738-22121	9407-738-22201	9407-738-22211	9407-738-22221
4x I	4x U	2x I, 2x U		4x I	4x U	2x I, 2x U
without transducer supply				with transducer supply		

RM 221

RM 222

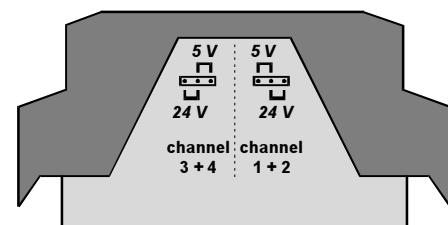
RM 222

### Note:

The -10...+10 V input can be switched to the range 0...+10 V via software.

The 0...20 mA input can be switched to the range 4...20 mA via software.

For 2 channels each the transducer supply can be switched from 24 V DC to controlled 5 V DC, so that there is a 5 V DC supply with max. 20 mA available for potentiometric transmitters.



## Technical Data RM 221 / RM 222

<b>Application:</b>	4 analog standard-signal inputs with the measuring ranges: 0..20 mA or 4..20 mA and 0..10 V or -10..10 V
	<ul style="list-style-type: none"> <li>● RM 221: with differential inputs</li> <li>● RM 222: with supply for transducers and potentiometric transmitters</li> </ul>
<b>Configuration:</b>	The 4 inputs can be designed for any combination of current or voltage measurement by the respective assembling of the module. Standard: 4x current, 4x voltage or 2x current / 2x voltage The desired measuring range is parameterized via the fieldbus.
<b>Power supply:</b>	The module is supplied with 24 V DC and 5 V DC via the bus board.
<b>Power consumption:</b>	<ul style="list-style-type: none"> <li>● RM 221: 24 V: 1.2 W, 5 V: 125 mW</li> <li>● RM 222: 24 V: 1.0 W, 5 V: 200 mW (without load at transducer supply)</li> </ul>
<b>Overload protection:</b>	Fuse in combination with suppressor diode
<b>A/D-converter:</b>	<ul style="list-style-type: none"> <li>● Process: 'successive-approximation'</li> <li>● Resolution: 12 bit, approx. 2.5 or 5.0 mV / 1 digit or approx. 4.1 or 5.1 <math>\mu</math>A / digit</li> </ul>
<b>Input impedance:</b>	<ul style="list-style-type: none"> <li>● RM 221: current input typ. 75 <math>\Omega</math>, voltage input typ. 390 k<math>\Omega</math></li> <li>● RM 222: current input typ. 75 <math>\Omega</math>, voltage input typ. 730 k<math>\Omega</math></li> </ul>
<b>Total error:</b>	<ul style="list-style-type: none"> <li>● RM 221: I: 0.755% U: 0.15% (of full range without differential voltage error)</li> <li>● RM 222: I: 0.26% U<sub>[0...10]</sub>: 0.28% U<sub>[-10...+10]</sub>: 0.45%</li> </ul>
<b>Characteristic curve deviation:</b>	<ul style="list-style-type: none"> <li>● RM 221: I: 0.055% U: 0.05% (of full range without differential voltage error)</li> <li>● RM 222: I: 0.1% U<sub>[0...10]</sub>: 0.05% U<sub>[-10...+10]</sub>: 0.09%</li> </ul>
<b>Deviation by temperature:</b>	<ul style="list-style-type: none"> <li>● RM 221: I: 0.14%/10K U: 0.02%/10K</li> <li>● RM 222: I: 0.016%/10K U<sub>[0...10]</sub>: 0.055%/10K U<sub>[-10...+10]</sub>: 0.073%/10K</li> </ul>
<b>Differential error:</b> (only RM 221)	RM 221: I: 0.55% of full range with max. common mode rejection of 30 VDC RM 221: U: <1 digit of full range with max. common mode rejection of 30 VDC
<b>Galvanic isolation:</b>	The logic-part is galvanically isolated from the inputs. The module version 'differential inputs' (RM 221) also has an isolation between the power supply and the inputs. (Isolation voltage 500 V DC) The inputs are not isolated from each other.
<b>Transducer supply:</b> (only RM 222)	<ul style="list-style-type: none"> <li>● The module version 'with transducer supply' (RM 222) provides each input with 24 V DC(10%), with a max. current of 25 mA. Condition: voltage supply of 24 V DC (<math>\pm 10\%</math>), connected to the fieldbus coupler.</li> <li>● For 2 channels each the transducer supply can be switched from 24 V DC to controlled 5 V DC, so that there is a 5 V DC supply with max. 20 mA (total) available for potentiometric transmitters.</li> </ul>
<b>Cycle times:</b>	100 ms
<b>Filter:</b>	<ul style="list-style-type: none"> <li>● Analog: low pass 2. order, cutoff frequency = 305 Hz</li> <li>● Digital: low pass 1. order (parameterizable average processing via fieldbus)</li> </ul>
<b>LED-Displays:</b>	Errors are displayed directly on the module with 4 red LEDs.
<b>Ambient Temperature:</b>	<ul style="list-style-type: none"> <li>● Operation: 0 ... +50 °C</li> <li>● Storage: -20 ... +70 °C</li> </ul>
<b>Humidity:</b>	$\leq 75\%$ humidity, no condensation
<b>Shock sensitivity:</b>	DIN 40046 IEC68-2-69
<b>EMC:</b>	<ul style="list-style-type: none"> <li>● DIN EN 50081 part 2</li> <li>● DIN EN 50082 part 2</li> <li>● DIN EN 61326</li> </ul> 
<b>Electrical connection:</b>	screw-/plug-in-terminals, line cross-section max. 2.5 mm <sup>2</sup>
<b>Class of protection:</b>	IP 20
<b>Dimensions:</b>	99 x 17.5 x 114.5 mm (h x w x d)
<b>Weight:</b>	51 g / 53 g (RM 221/ RM 222)
<b>Housing:</b>	Polyamid PA 6.6, combustibility class V0 according to UL 94
<b>Montage:</b>	plugged-in and locked in front of base module
<b>Usage position:</b>	vertical