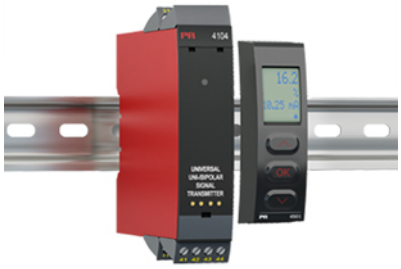
PERFORMANCE MADE SMARTER



Universal uni-/bipolar signal transmitter

4104

– Measures and outputs uni-/bipolar voltage and current signals
– Works with both passive and active inputs and outputs
– Uses the PR 4500 display series for programming and process monitoring
– Fast < 20 ms response time and excellent < 0.05% accuracy
– Universally powered by 21.6…253 VAC / 19.2...300 VDC

Application

- Fast < 20 ms response time for measuring signals produced by torque, position, current & acceleration sensors.
- User configurable bipolar or unipolar I/O means the 4104 is suitable for nearly any voltage or current conversion.
- The excitation source enables measurement of two or three wire transmitters.
- The active or passive I/O makes the 4104 perfect for power matching current loops.
- Converts narrow bipolar inputs to wide bipolar or unipolar outputs, e.g., ±1 volt input = ±10 volt or 4...20 mA output.
- Selectable direct or inverse I/O makes the 4104 suitable for proportional control applications.
- The "V-curve" function outputs 100% – 0 – 100% when a 0 – 100% input signal is present.

Technical characteristics

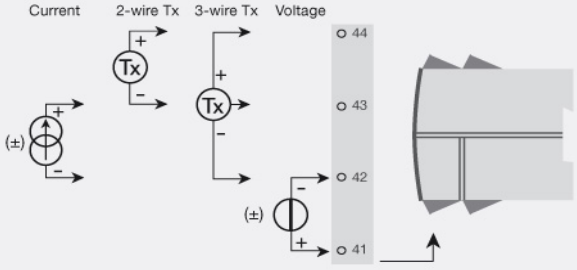
- The latest analog and digital techniques are used to obtain maximum accuracy and immunity to interference.
- The current output can drive up to 800 Ohms, with an adjustable response time of 0.0…60.0 seconds.
- Exceptional mA output load stability of < 0.001% of span/100 Ohm.
- Meets the NAMUR NE21 recommendations, ensuring high accuracy in harsh EMC environments.
- Meets the NAMUR NE43 recommendations, allowing the control system to easily detect a sensor error.
- Each unit is tested to a high 2.3 kVAC, 3-port galvanic isolation level.
- Excellent signal to noise ratio of > 60 dB.

Mounting / installation / programming

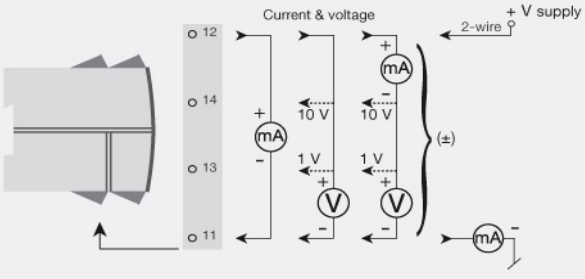
- Very low power consumption means units can be mounted side by side without an air gap – even at 60°C ambient temperature.
- Approved for marine applications.
- Configuration, monitoring, 2-point process calibration and more are accomplished using PR's 4500 series of detachable displays.
- All programming can be password protected.

Applications

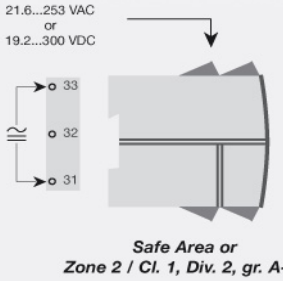
Input signals



Output signals



Supply



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Order:

Type
4104

Environmental Conditions

Operating temperature	-20°C to +60°C
Storage temperature	-20°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree	IP20
Installation in	Pollution degree 2 & meas. / overvoltage cat. II

Mechanical specifications

Dimensions (HxWxD)	109 x 23.5 x 104 mm
Weight approx.	155 g
Weight incl. 4501 / 451x (approx.)	170 g / 185 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13...2.08 mm^2 AWG 26...14 stranded wire
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6
2...13.2 Hz	±1 mm
13.2...100 Hz	±0.7 g

Common specifications

Supply

Supply voltage, universal	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Max. required power	≤ 2.5 W
Max. power dissipation	≤ 2.5 W

Isolation voltage

Isolation voltage, test / working	2.3 kVAC / 250 VAC

Response time

Response time (0...90%, 100...10%)	< 20 ms

Auxiliary supplies

2-wire loop supply	> 16 V / 20 mA
3-wire loop supply	> 18 V / 20 mA
Loop supply limitation	30 mA
Programming	PR 4500 communication interfaces
Signal / noise ratio	> 60 dB
Cut-off frequency (3 dB)	> 40 Hz
Accuracy	Better than 0.05% of selected range
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE21, A criterion, burst	< ±1% of span

Input specifications

Current input

Signal range	±23 mA
Programmable measurement ranges	0...20 and 4...20 mA
Programmable measurement ranges	± 10 and ± 20 mA
Input voltage drop	1.4 V @ 20 mA
Loop error detection, 4...20 mA: Low	< 3.6 mA
Loop error detection, 4...20 mA: High	> 21 mA

Voltage input

Signal range	±12 V
Programmable measurement ranges	0/0.2...1, 0/1...5, 0/2...10 VDC
Programmable measurement ranges	±1, ±5 and ±10 V
Input resistance	> 2 MΩ

Output specifications

Current output

Signal range	0...23 mA (unipolar)
Signal range	-23...+23 mA (bipolar)
Current limit	≤ 28 mA (unipolar)
Current limit	± 28 mA (bipolar)
Load stability	≤ 0.001% of span / 100 Ω
Response time, programmable	0.0...60.0 s
Output limitation, on 4...20 and 20...4 mA signals	3.8...20.5 mA
Output limitation, on other unipolar mA signals	0 and 115% of max. value
Output limitation, on bipolar mA signals	±115% of min. & max. values
Sensor error indication, at 4...20 mA input: selectable	Low, High, Zero, None

Active unipolar and bipolar mA output

Programmable ranges	0...20 and 4...20 mA
Programmable ranges	±10 and ±20 mA
Programmable ranges	Direct or Inverted Action
V-curve function, active signals, 100-0-100%	20-0-20 mA
Load (@ current output)	≤ 800 Ω

Passive 2-wire mA output

Programmable ranges	0...20 and 4...20 mA
Programmable ranges	Direct or Inverted action
V-curve function, 100-0-100%	20-0-20 mA
External loop supply	3.5 - 26 V

Voltage output

Programmable signal ranges	0/0.2...1; 0/1...5 ; 0/2...10 V
Programmable signal ranges	±1, ±5 and ±10 V
Programmable signal ranges	Direct or Inverted action
V-curve function, 100-0-100%	1-0-1, 5-0-5 and 10-0-10 V
Load (@ voltage output)	≥ 500 kΩ
Response time, programmable	0.0...60.0 s
Output limitation - outside range: on unipolar V signals starting from 0	0 and 115% of max. value
Output limitation - outside range: on unipolar V signals with offset	-5% of min. value and 115% of max. value
Output limitation - outside range: on bipolar V signals	±115% of min. & max. values
Sensor error indication, at 4...20 mA input: selectable	Low, High, Zero, None

Observed authority requirements

EMC	2014/30/EU & UK SI 2016/1091
LVD	2014/35/EU & UK SI 2016/1101
RoHS	2011/65/EU & UK SI 2012/3032
EAC	TR-CU 020/2011

Approvals

c UL us, UL 508	E248256
FM	3025177
DNV Marine	TAA0000101