



Isolators & converters

The 3100 series

ADDING VALUE TO FACTORY AND PROCESS AUTOMATION



isolation



display



i.s. interface



temperature



universal





THE SLIM SERIES FOR A WIDE RANGE OF APPLICATIONS

The 3100 series

PR electronics sets new standards for signal conditioning with 6 mm devices

There are products designed for factory automation and products designed for process automation... and then there are the slim converters and isolators of the 3100 series, that cover it all!



Our secret rests in units with unequalled strengths, namely:

- Wide range of I/O
- Easy to configure
- High galvanic isolation
- Fast response time
- High accuracy
- High vibration immunity
- Excellent noise emission and immunity specifications
- Wide operating ambient temperature range
- Our approvals
- Our price

Applications

The 3100 series is ideal for conversion and isolation of analog signals in many industries, including:

- Packaging
- Material handling
- Printing and paper industry
- Automotive industry
- Robotics
- Building automation and HVAC
- Industrial cleaning
- Shipbuilding
- Test panels
- Wood industry
- Power production
- Process automation
- DCS manufacturing and PLC integration

Patent-pending state-of-the-art technology

The 3100 series shows why PR electronics is one step ahead. It is the result of our long experience with high-quality signal conditioning - and that expertise gives you:

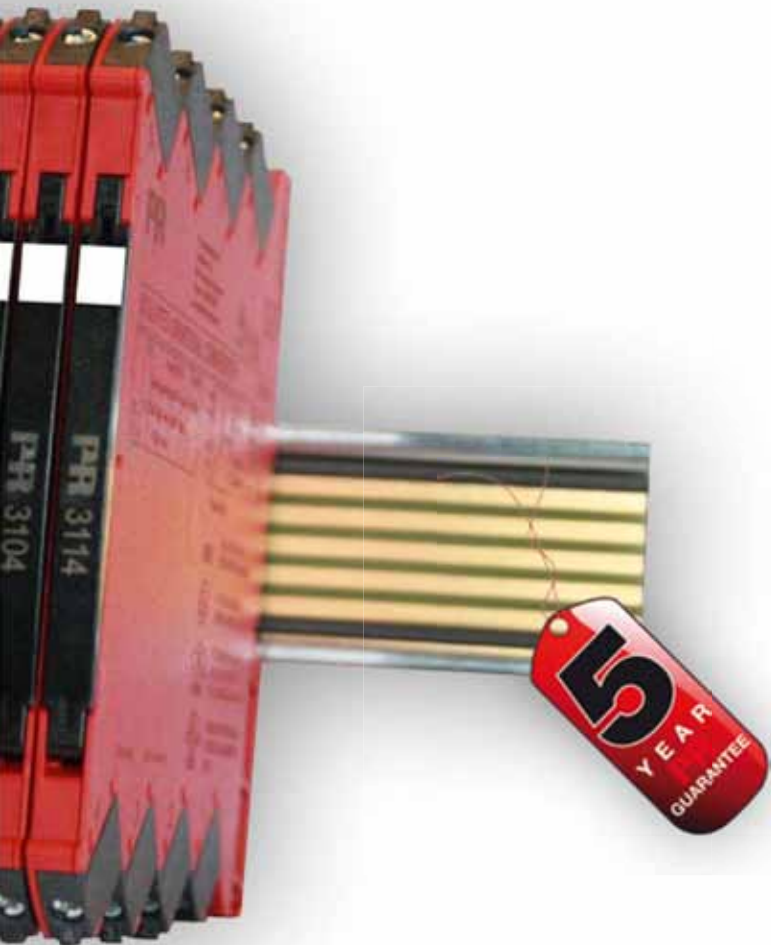
High reliability at low prices

Our innovative microprocessor technology (Patent Pending #PA 2010 00359) ensures high accuracy, short response time, low temperature coefficient and good linearity - at an incredibly competitive price!

The world's lowest noise emission

Our spread spectrum technology (Patent Pending #PA 2010 00360) ensures that the noise emission of the devices is uniquely low - and thus far below the limits of the EMC directive.





SIGNAL CONDITIONING IS A MATTER OF CONFIDENCE

Taking care of industrial measurement and control signals means taking care of efficiency and safety. With a strong emphasis on this fact, PR electronics has developed signal conditioning devices for 35 years and achieved a strong position in the global automation market.

PR electronics' products

PR electronics' devices are individually tested and have earned an international reputation for their exceptionally high quality. The 3100 series and our other product families offer features such as:

- User-friendly, cost-effective devices
- Factory-calibrated devices with short response time and high basic accuracy (min./max. values - not just typical values)
- High galvanic isolation and better EMC performance than required by the EMC directive (IEC 61326-1) and NAMUR NE21
- High long-term stability and low temperature coefficient
- Advanced self-diagnostics and alarm functions in case of cable, sensor or supply error
- Universal devices that are easy to configure

PR electronics' customer service

Our motto "Signals the Best" covers more than our products; it includes all our operations - and as a customer you get:

- a global partner with subsidiaries and distributors in more than 50 countries
- competent and free technical advising
- fast delivery and 5-year guarantee
- thorough and easily accessible technical documentation



In panels and field installations around the world you can find the red isolators, converters, displays and I.S. interfaces which are developed and produced by PR electronics at our headquarters in Denmark.





The 3100 series - overview

Isolators and converters for RTD, TC, potentiometer, mA and V signals. Designed for DIN rail or power rail mounting

Slender design and budget-friendly prices do not suffice when the aim is an outstanding product. Therefore, we have equipped the 3100 series with three additional advantages: user-friendliness, flexibility and razor sharp technical specifications...

3103 ISOLATED REPEATER

Isolation and 1:1 conversion of current signals within the range 0...20 mA.

- Response time: <7 ms
- Accuracy $\leq \pm 0.05\%$ of span

3104 ISOLATED CONVERTER

Isolation and conversion of standard DC signals. Isolates and excites 2-wire transmitters.

- Response time: <7 ms
- Loop supply >17 V @ 20 mA
- Accuracy $\leq \pm 0.05\%$ of span
- DIP-switch configured

3109 ISOLATED CONVERTER / SPLITTER

Isolation and conversion of standard DC signals. Isolates and excites 2-wire transmitters.

- Splitter function: 1 in - 2 out. Each output individually configurable.
- Response time: <7 ms
- Loop supply >17 V @ 20 mA
- Accuracy $\leq \pm 0.05\%$ of span
- DIP-switch configured

3114 ISOLATED UNIVERSAL CONVERTER

Conversion and isolation of analog signals. Provides excitation and isolation for 2-wire transmitters.

- Input: 2-, 3- and 4-wire
- Response time: 0.4 / 1.0 s
- Loop supply > 15 V @ 20 mA
- Accuracy $\leq \pm 0.1\%$ of span
- Programmable via 4501 display and 4590 adapter
- Internal CJC

STRONG SIGNAL CONDITIONING:

- Response times < 5 or 7 ms
- Accuracies $\pm 0.05\%$* or $\pm 0.1\%$ of span
- Temperature coefficients $\pm 0.01\%$ of span/$^{\circ}\text{C}$
- 3 or 4 port 2.5 kVAC galvanic isolation
- I.S. approvals: FM Div.2, ATEX Zone 2, IECEx Zone 2
- Polarity-protected terminals and supply *

- Easily configured via DIP-switches or display with adapter
- Energized via the power rail, terminals or loop power
- Factory-calibrated measurement ranges *
- Wide ranging supply voltage: 24 VDC $\pm 30\%$ *
- Loop supply >17 V / 20 mA *
- Output load impedance: 600 Ω *



3105 ISOLATED CONVERTER

INPUT
0/2...10 V
0/1...5 V
0/4...20 mA

OUTPUT
0/2...10 V
0/1...5 V
0/4...20 mA

SUPPLY

Isolation and conversion of standard DC signals.
Ultra low-cost.

- Response time: <7 ms
- DIP-switch configured

3108 ISOLATED REPEATER / SPLITTER

INPUT 1
0/4...20 mA

OUTPUT 1
0/4...20 mA

OUTPUT 2
0/4...20 mA

SUPPLY

Isolation and 1:1 conversion of current signals within the range 0...20 mA.

- Splitter function: 1 in – 2 out
- Response time: <7 ms
- Accuracy $\pm 0.05\%$ of span

3185A1/A2 LOOP-POWERED ISOLATOR

INPUT 1
+ supply
0/4...20mA

OUTPUT 1
0/4...20 mA

INPUT 2
+ supply

OUTPUT 2

1 or 2 channels

Isolation and 1:1 conversion of current signals within the range 4...20 mA.

- Unit is powered by the input loop
- 1 or 2 channels
- Response time: <5 ms
- Low voltage drop: ≤ 1.2 V
- Accuracy $\pm 0.1\%$ of span

3186A1/A2 2-WIRE TRANSMITTER ISOLATOR

supply

INPUT 1
4...20 mA

OUTPUT 1
4...20 mA

INPUT 2

OUTPUT 2

1 or 2 channels

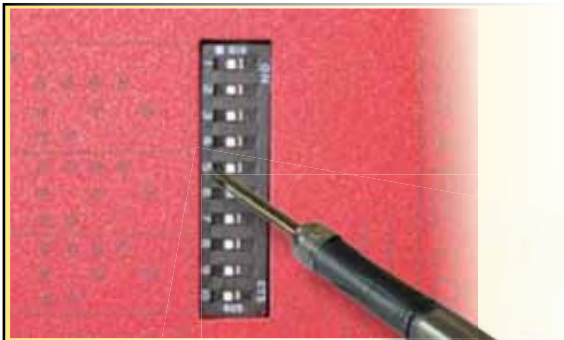
Isolation and 1:1 conversion of current signals within the range 4...20 mA.

- Unit is powered by the output loop
- Excitation source for 2-wire transmitters
- 1 or 2 channels
- Response time: <5 ms
- Drop voltage: ≤ 2.5 V
- Accuracy $\pm 0.1\%$ of span



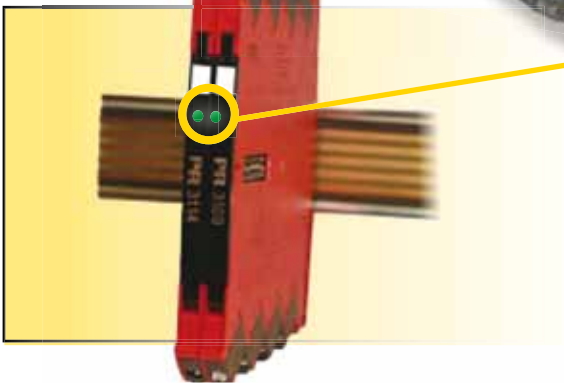
RELIABLE, FLEXIBLE

THE 3100



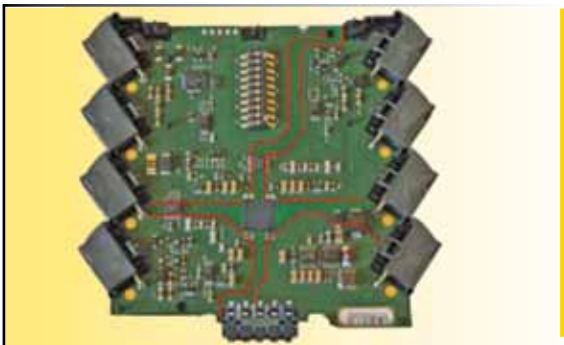
Rational DIP-switch setting
Each DIP-switch has only one function (logic coding), and changing switch positions during operation will take effect only after cycling power.

Signal conditioning with patent-pending technology ensures:
No re-calibration after DIP-switch programming.

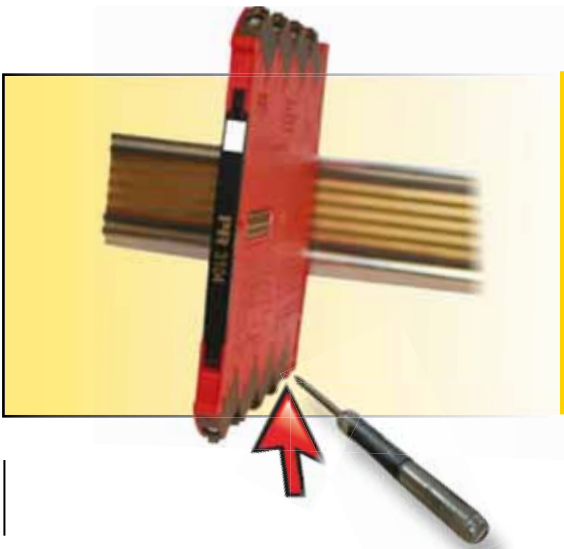


Reliable watchdogs
LED indicates an error in the setup, hardware or power supply. Power-up only possible at the correct supply voltage.

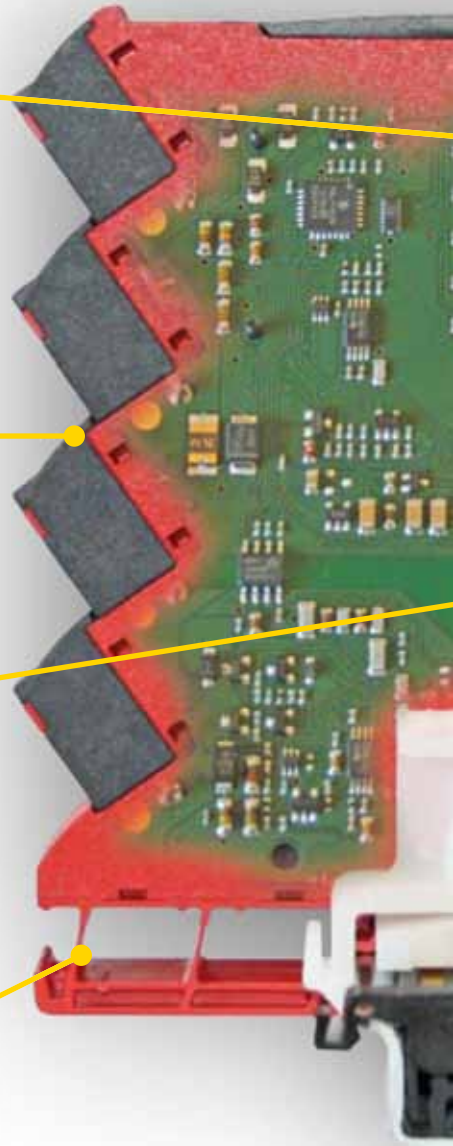
Unique protection against wiring errors
All inputs and outputs are protected against wiring errors, as the device can withstand 24 VDC $\pm 30\%$ on all pins. All inputs and outputs are protected against overload.



Effective isolation to EN 61010-1 and EN 61140
3 or 4 port 2.5 kVAC galvanic isolation by virtue of a broad separation between ports plus digital isolation technology. The 8 terminals permit 2 galvanically separated outputs and two channels.



Easy mounting / dismantling
The devices snap onto a power rail or DIN rail and are detached by lifting the bottom lock.

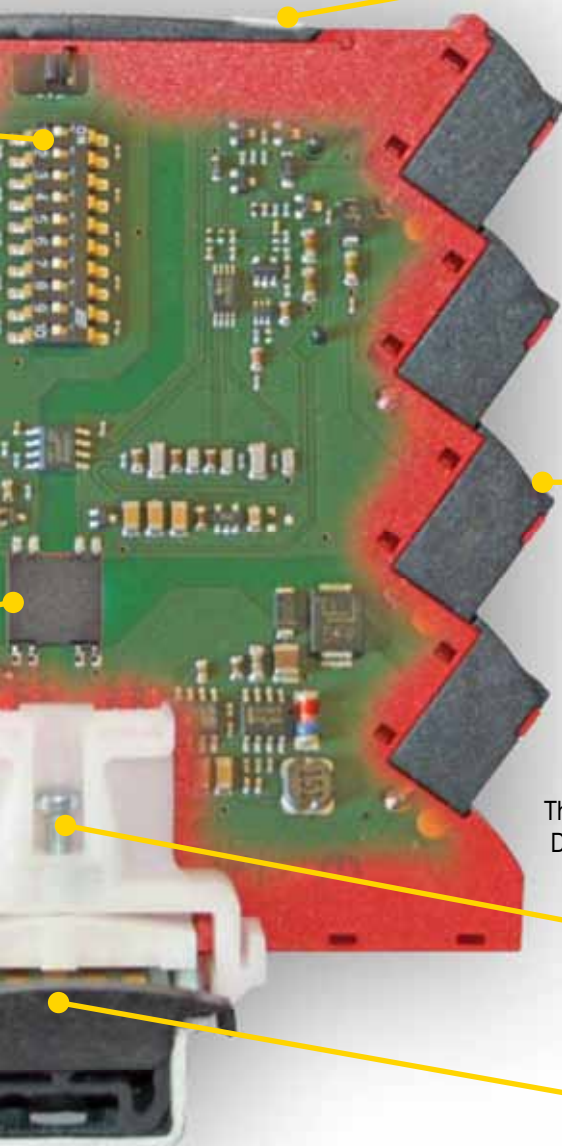


Wide ambient te



Working te
(ambient): -

AND USER-FRIENDLY SERIES



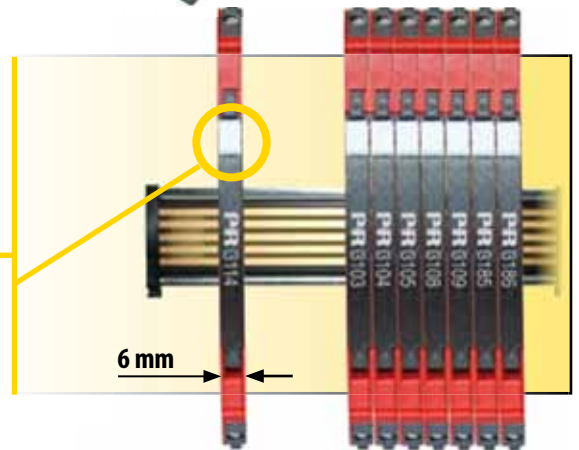
Universal signal conditioning

The isolated universal converter 3114 is configured in seconds using the model 4590 adapter, and the user-friendly model 4501 display.



Space-saving design

The devices are only 6 mm wide and can be mounted next to each other, permitting up to 330 channels/m.

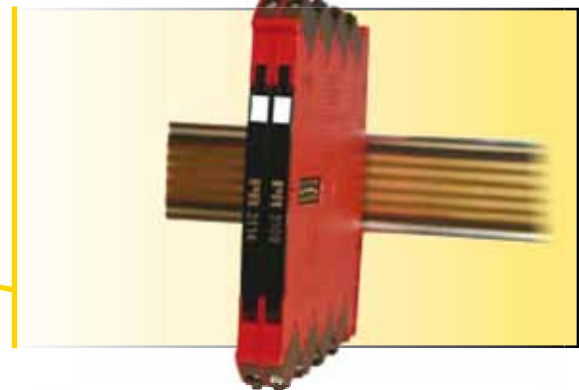


Quick identification

The devices can be mounted with labels, type MF 5/7.5, from Weidmüller's MultiCard system.

Unshakable electronics

The devices are vibration-tested via DNV and GL approvals and can be retained on the rail with the 9404 module stop.

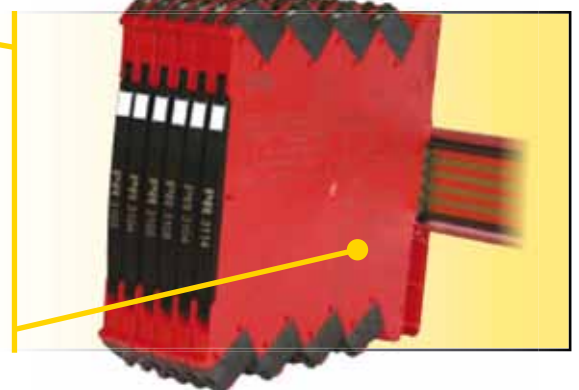


Flexible supply

Uniquely flexible supply voltage:
24 VDC \pm 30%.

User-friendly label design

All information relevant to installation is visible and easy to read.



Temperature range



Temperature
25...+70°C



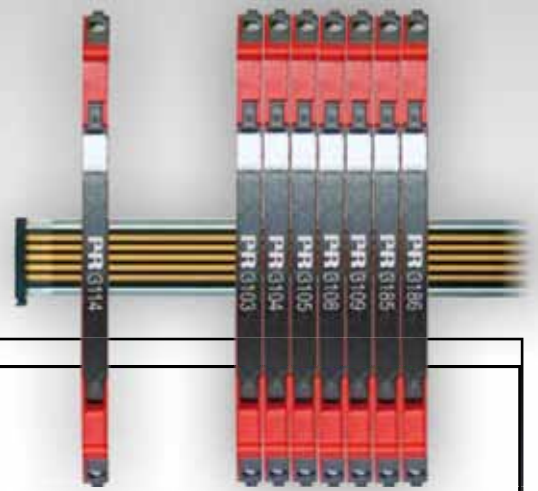
The 310 TECHNICAL S

	3100 series	Passive	Universal	
FUNCTION / DESCRIPTION	PR type no.	3185A1 3185A2	3186A1 3186A2	3114
	PR product name:	Loop-Powered Isolator	2-Wire Transmitter Isolator	Isolated Universal Converter
	Description:	1 or 2 channel passive loop isolator Input loop-powered	1 or 2 channel passive loop isolator 2-wire input	Universal DC / DC and temperature converter with loop supply output
	Function:			
	Parameterization:	None	None	4501 / ConfigMate 4590
INPUT	Input signal:	0/4...20 mA)	4...20 mA	RTD, TC and potentiometer 2-, 3-, and 4-wire 0...10 V 0...20 mA
	2-wire supply:		Loop - drop	> 15 V @ 20 mA
	Sensor type:			All standard Pt, Ni, TC
	CJC sensor:			Internal Pt100
OUTPUT	Output signal: (active)	0/4...20 mA	4...20 mA passive (8...35 VDC)	0...20 mA / 0...10 V
	Output load impedance:	600 Ω		600 Ω (mA) - 10 kΩ (Vout)
TECHNICAL SPECIFICATIONS	Accuracy:	< ±0.1% of span	< ±0.1% of span	< ±0.1% of span
	Basic accuracy, mA:	< ±20 μA	< ±16 μA	< ±16 μA
	Load stability	< 0.03% of span / 100 Ω	0.005% of span	< 0.01% of span / 100 Ω
	Temperature coefficient:	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C
	Supply voltage:	≤ 1.2 V (drop) @ 25°C	≤ 2.5 V (drop)	24 VDC +/- 30%
	Power rail compatible:			YES (supply)
	Response time: (0...90%)	< 5 ms	< 5 ms	0.4 / 1.0 s
	Max. operating frequency:	100 Hz	100 Hz	
	Power consumption:	20 mA / channel	20 mA / channel	max. 1.2 W
	Dimensions (HxWxD):	113 x 6.1 x 115	113 x 6.1 x 115	113 x 6.1 x 115
	Protection degree:	IP20	IP20	IP20
	Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span	< ±1% of span	< ±1% of span
	Operating temperature:	-25...+70°C	-25...+70°C	-25...+70°C
	Isolation:	Test / operation 2.5 kVAC / 250 VAC	Test / operation 2.5 kVAC / 250 VAC	Test / operation 2.5 kVAC / 250 VAC
	Approvals:			

Typical value: Input = 20 mA, output = 20 mA, loop supply not activated, load resistance = 0...300 Ω (for 3108/3109 = 0...150 Ω)



0-series SPECIFICATIONS



Fixed Input

	3104	3108	3109	3105
Repeater	Isolated Converter	Isolated Repeater / Splitter	Isolated Converter / Splitter	Isolated Converter
Loop isolator / repeater	Loop isolator / converter for standard DC signals - with DIP-switch setup	Fixed loop isolator / repeater with dual output	Loop isolator / converter for standard DC signals - with DIP-switch setup and dual output	Loop isolator / converter for standard DC signals - with DIP-switch setup Low-cost
Diagram				
DIP-switch	DIP-switch	None	DIP-switch	DIP-switch
Input	0/2...10 V 0/1...5 V 0/4...20 mA	0...20 mA	0/2...10 V 0/1...5 V 0/4...20 mA	0/2...10 V 0/1...5 V 0/4...20 mA
Output	> 17 V @ 20 mA		> 17 V @ 20 mA	
Input Impedance	0/2...10 V 0/1...5 V 0/4...20 mA	0...20 mA (1:1:1)	0/2...10 V 0/1...5 V 0/4...20 mA (individual setup for each output)	0/2...10 V 0/1...5 V 0/4...20 mA
Output Impedance	600 Ω - 10 kΩ (Vout)	2 x 300 Ω	2 x 300 Ω - 10 kΩ (Vout)	600 Ω - 10 kΩ (Vout)
Linearity	< ±0.05% of span	< ±0.05% of span	< ±0.05% of span	< ±0.2% of span
Accuracy	< ±8 μA	< ±8 μA	< ±8 μA	< ±32 μA
Temperature Drift	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.015% of span / °C
Supply Voltage	24 VDC +/- 30%	24 VDC +/- 30%	24 VDC +/- 30%	24 VDC +/- 30%
Supply	YES (supply)	YES (supply)	YES (supply)	YES (supply)
Response Time	< 7 ms	< 7 ms	< 7 ms	< 7 ms
Frequency	> 100 Hz	> 100 Hz	> 100 Hz	> 100 Hz
Power	typical/max. 0.45 (1.2) W	typical/max. 0.45 (0.8) W	typical/max. 0.45 (1.2) W	typical/max. 0.45 (0.8) W
Dimensions	113 x 6.1 x 115	113 x 6.1 x 115	113 x 6.1 x 115	113 x 6.1 x 115
Protection	IP20	IP20	IP20	IP20
Span Error	< ±1% of span	< ±1% of span	< ±1% of span	< ±1% of span
Temperature Range	-25...+70°C	-25...+70°C	-25...+70°C	0...+70°C
Operation	Test / operation 2.5 kVAC / 250 VAC	Test / operation 2.5 kVAC / 250 VAC	Test / operation 2.5 kVAC / 250 VAC	Test / operation 2.5 kVAC / 250 VAC



No FM, ATEX



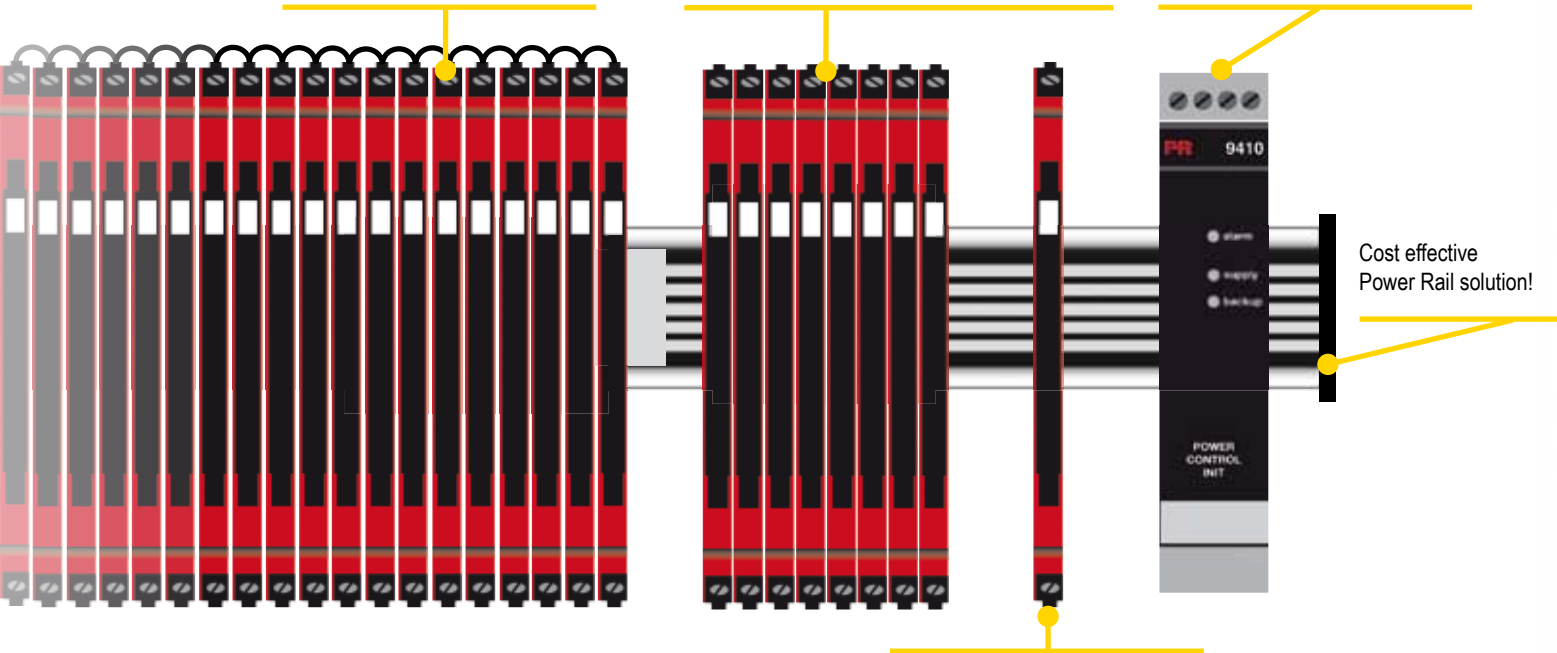
3100 - Power wiring

The units can be powered by connecting 24 VDC $\pm 30\%$ to one unit and daisy-chaining power to additional units. Up to 130 units can be energized in this way. Protective fuse: 2.5 A.

Alternately, 24 V power can be distributed via a power rail that receives voltage from another energized unit (3103, -04, -05, -08, -09 or -14). Up to 20 units can be powered this way. Protective fuse: 0.4 A.

Redundant power is possible with the 9410 power control unit. This solution can power up to 200 units.

Protective fuse: PR 9410.

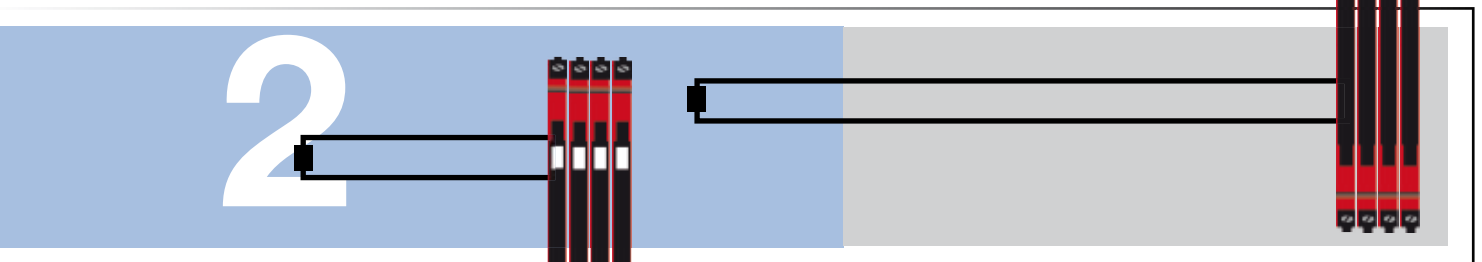


The power connector unit 3405 is a stand-alone supply unit which supplies the power rail. With 3405, up to 100 units can be powered. Protective fuse: 2.5 A.

Space-saving I.S. SIGNAL CONDITIONING

All devices in the 3100 series, except model 3105, have the ATEX, FM and IECEx I.S. approvals and can be installed in the safe area or in zone 2 / division 2

- For European installations: Protection degree IP54 required.
- For US installations: Field Wiring (pipe installation) required.



3114 - MULTI-TALENTED AND CONVENIENT

The model 3114 handles loads of applications and is configured in seconds ...



4501

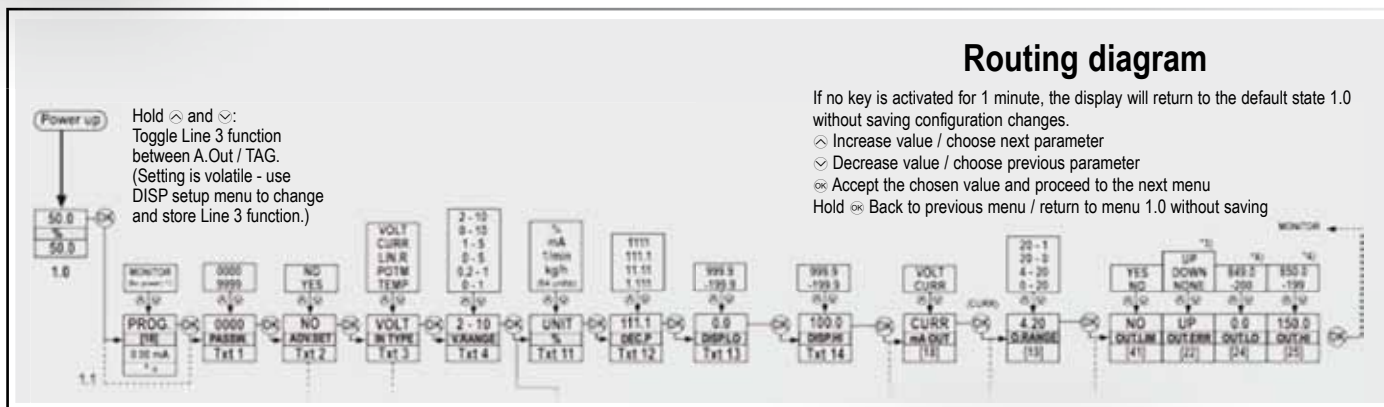


The model 4501 display and ConfigMate 4590 adapter provide:

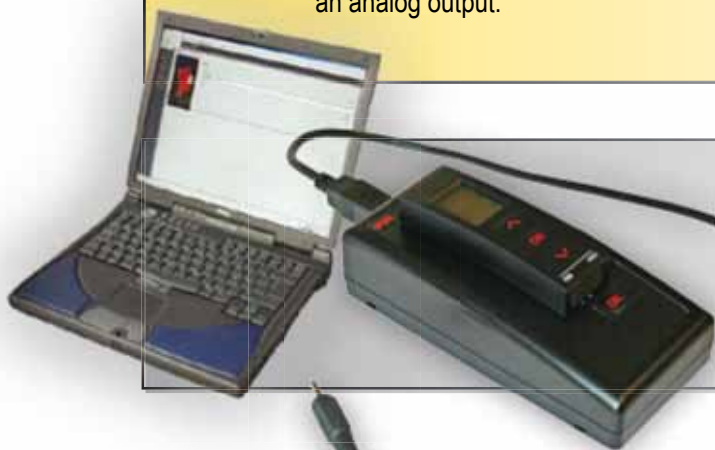
- **Configuration in no time**
The 3114 is easily configured using the model 4501 display and 4590 adapter. All selections are made via three push buttons on the display, and scrolling text guides you effortlessly through the configuration. The help text exists in seven languages in the display menu. Of course, 3114 can be also be delivered pre-configured, just like the devices with DIP-switch configuration.
- **Quick copying of the configuration**
Using the display and the adapter it's easy to copy the configuration to other 3114 units or to a PC.
- **Password protection**
In order to protect the configuration against unauthorized changes, password protection is provided.
- **Diagnostic tool for service engineers**

PR menu structure – makes configuration straightforward!

When configuring the 3114, you don't need to keep track of your progress. There is only one way through the menu – forwards or backwards – and scrolling help text in the 4501 display ensures that you will get through all necessary items.



The 3114 measures all common analog signals, (RTD, TC, potentiometer, mA and V), and provides an analog output.



4590

The adapter 4590 can be powered via battery or a PC USB port.



3114

Signals the Best

Around the world, PR electronics helps create increased efficiency and safety via industrial signal conditioning. The means to achieve this is reliable, flexible and user-friendly devices, thorough technical documentation, fast delivery and competent technical support – in short, all aspects which are of importance to our customers.



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