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.
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.

**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
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 <±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 <±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 <±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 <±0.1% of span
  - Programmable via 4501 display and 4590 adapter
  - Internal CJC
STRONG SIGNAL CONDITIONING:

- Response times < 5 or 7 ms
- Accuracies <±0.05%* or <±0.1% of span
- Temperature coefficients <±0.01% of span/°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 ±30% *
- Loop supply >17 V / 20 mA *
- Output load impedance: 600 Ω *

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**ISOlated CONVeRTER**

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

SUPPLY

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

Isolation and conversion of standard DC signals.
Ultra low-cost.
- Response time: <7 ms
- DIP-switch configured

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**ISOlated RepEATER / SPLiTTER**

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

SUPPLY

OUTPUT
0/4...20 mA
0/4...20 mA

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 <±0.05% of span

---

**LoOp-POWeReD IsolaTOR**

\+

INPUT 1
0/4...20 mA

\+

INPUT 2
0/4...20 mA

\+

OUTPUT 1
0/4...20 mA

\+

OUTPUT 2
0/4...20 mA

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 <±0.1% of span

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**2-WiRE TRANSMITTER IsolaTOR**

\+

INPUT 1
4...20 mA

\+

INPUT 2
4...20 mA

\+

OUTPUT 1
4...20 mA

\+

OUTPUT 2
4...20 mA

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 <±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 ±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 / dismounting
The devices snap onto a power rail or DIN rail and are detached by lifting the bottom lock.

Wide ambient temperature range
Working temperature (ambient): -25 °C
**AND USER-FRIENDLY SERIES**

**Flexible supply**
Uniquely flexible supply voltage:
24 VDC±30%.

**User-friendly label design**
All information relevant to installation is visible and easy to read.

**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.

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

**Wide ambient temperature range**
Working temperature (ambient): -25...+70°C

**User-friendly and flexible and design**
### 3100 series

<table>
<thead>
<tr>
<th>Function / Description</th>
<th>Passive</th>
<th>Universal</th>
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<tbody>
<tr>
<td>PR type no.</td>
<td>3185A1</td>
<td>3186A1</td>
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<tr>
<td>PR product name:</td>
<td>3185A2</td>
<td>3186A2</td>
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<tr>
<td>Description:</td>
<td>Loop-Powered Isolator</td>
<td>2-Wire Transmitter Isolator</td>
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<tr>
<td>Function:</td>
<td>1 or 2 channel passive loop isolator</td>
<td>1 or 2 channel passive loop isolator</td>
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<tr>
<td>Parameterization:</td>
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<td>None</td>
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<tr>
<td>Input signal:</td>
<td>0/2...20 mA</td>
<td>4...20 mA</td>
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<tr>
<td>2-wire supply:</td>
<td>None</td>
<td>Loop-drop</td>
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<tr>
<td>Sensor type:</td>
<td>2-wire input</td>
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<tr>
<td>CJC sensor:</td>
<td>passive (8...35 VDC)</td>
<td>Internal Pt100</td>
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<tr>
<td>Output signal: (active)</td>
<td>0/2...20 mA</td>
<td>4...20 mA</td>
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<tr>
<td>Output load impedance:</td>
<td>600 Ω</td>
<td>passive (8...35 VDC)</td>
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<td>Accuracy:</td>
<td>&lt; ±0.1% of span</td>
<td>&lt; ±0.1% of span</td>
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<tr>
<td>Basic accuracy, mA:</td>
<td>&lt; ±20 µA</td>
<td>&lt; ±0.1% of span</td>
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<tr>
<td>Load stability:</td>
<td>&lt; 0.03% of span / 100 Ω</td>
<td>&lt; ±16 µA</td>
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<tr>
<td>Temperature coefficient:</td>
<td>&lt; ±0.01% of span / °C</td>
<td>&lt; 0.009% of span</td>
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<tr>
<td>Supply voltage:</td>
<td>≤ 1.2 V (drop) @ 25°C</td>
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<td>Power rail compatible:</td>
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<td>100 Hz</td>
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<td>Response time: (0...90%)</td>
<td>&lt; 5 ms</td>
<td>&lt; 5 ms</td>
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<td>Max. operating frequency:</td>
<td>100 Hz</td>
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<td>Power consumption:</td>
<td>20 mA / channel</td>
<td>20 mA / channel</td>
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<td>Dimensions (HxWxD):</td>
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<td>113 x 6.1 x 115</td>
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<td>Protection degree:</td>
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<tr>
<td>Extended EMC immunity:</td>
<td>&lt; ±1% of span</td>
<td>&lt; ±1% of span</td>
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<tr>
<td>Operating temperature:</td>
<td>-25...+70°C</td>
<td>-25...+70°C</td>
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<tr>
<td>Isolation:</td>
<td>Test / operation 2.5 kVAC / 250 VAC</td>
<td>Test / operation 2.5 kVAC / 250 VAC</td>
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<tr>
<td>Approvals:</td>
<td></td>
<td></td>
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</table>

**Typical value:** Input = 20 mA, output = 20 mA, loop supply not activated, load resistance = 0...300 Ω (for 3108/3109 = 0...150 Ω)
### 3104 - Isolated Converter

**Loop isolator / converter for standard DC signals - with DIP-switch setup**

- **DIP-switch**
  - 0/2...10 V
  - 0/1...5 V
  - 0/4...20 mA
  - > 17 V @ 20 mA

- **Input**
  - 24 VDC +/- 30%

- **Typical/Max. Power Consumption**
  - 0.45 (0.8) W

- **Dimensions**
  - 113 x 6.1 x 115

- **Certifications**
  - IP20

- **Temperature Range**
  - -25...+70°C

- **Test / Operation**
  - 2.5 kVAC / 250 VAC

### 3108 - Isolated Repeater / Splitter

**Fixed loop isolator / repeater with dual output**

- **DIP-switch**
  - None

- **Input**
  - 24 VDC +/- 30%

- **Typical/Max. Power Consumption**
  - 0.45 (0.8) W

- **Dimensions**
  - 113 x 6.1 x 115

- **Certifications**
  - IP20

- **Temperature Range**
  - -25...+70°C

- **Test / Operation**
  - 2.5 kVAC / 250 VAC

### 3109 - Isolated Converter / Splitter

**Loop isolator / converter for standard DC signals - with DIP-switch setup and dual output**

- **DIP-switch**
  - 0/2...10 V
  - 0/1...5 V
  - 0/4...20 mA

- **Input**
  - 24 VDC +/- 30%

- **Typical/Max. Power Consumption**
  - 0.45 (1.2) W

- **Dimensions**
  - 113 x 6.1 x 115

- **Certifications**
  - IP20

- **Temperature Range**
  - -25...+70°C

- **Test / Operation**
  - 2.5 kVAC / 250 VAC

### 3105 - Isolated Converter

**Loop isolator / converter for standard DC signals - with DIP-switch setup Low-cost**

- **DIP-switch**
  - None

- **Input**
  - 24 VDC +/- 30%

- **Typical/Max. Power Consumption**
  - 0.8 W

- **Dimensions**
  - 113 x 6.1 x 115

- **Certifications**
  - IP20

- **Temperature Range**
  - 0...+70°C

- **Test / Operation**
  - 2.5 kVAC / 250 VAC

### 3103 - Isolated Repeater

**Fixed loop isolator / repeater**

- **DIP-switch**
  - None

- **Input**
  - 0...20 mA

- **Typical/Max. Power Consumption**
  - 0.8 W

- **Dimensions**
  - 113 x 6.1 x 115

- **Certifications**
  - IP20

- **Temperature Range**
  - -25...+70°C

- **Test / Operation**
  - 2.5 kVAC / 250 VAC

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**Note:**

- **FM:** No FM, ATEX Listed.
3100 - Power wiring

The units can be powered by connecting 24 VDC ±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.

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

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.

Routing diagram
If no key is activated for 1 minute, the display will return to the default state 1.0 without saving configuration changes.
- Increase value / choose next parameter
- Decrease value / choose previous parameter
- Accept the chosen value and proceed to the next menu
Hold = Back to previous menu / return to menu 1.0 without saving

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 - MULTI-TALENTED AND CONVENIENT

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