PR®

I.S. Interfaces

The 9000 series

ADDING VALUE TO FACTORY AND PROCESS AUTOMATION

PR SIL2 IEC 61508 CERTIFIED Full assessment

display

i.s. interface

isolation

temperature

universal

Outstanding I.S. Signal

PR electronics is one of the world's leading manufactures of intrinsically safe modules for industrial signal conditioning and process control. Our range of I.S. interfaces comply with the strictest safety requirements, and are used all over the world.

A wide selection of user-friendly I.S. modules

Our flexible I.S. interfaces provide solutions for nearly every application involving analog, digital or HART® signals. Our product range is uncompromising in its reliability and user-friendliness, and as a customer you will be pleased to discover:

- Reliable, individually tested I.S. interfaces with a 5-year guarantee
- Interfaces that help you optimize your process by providing alarms for cable and sensor errors
- A technology which saves you the trouble of creating and maintaining costly I.S. grounding
- Interfaces with fast response time allowing accurate process measurement
- SIL 2-certified I.S. interfaces
- A power rail system which supplies and monitors your I.S. interfaces with a minimum of wiring
- Easy configuration via detachable LCD display or PC
- Highly-qualified technical experts – we have more than 30 years' experience in the development of signal conditioning and process control equipment
- An ISO 9001-certified supplier with subsidiaries and distributors in more than 40 countries

Application

I.S. interfaces from PR electronics are connected between the sensors mounted in the process and the overall control system. The product range includes unique features such as:

- State-of-the-art EMC performance
- High galvanic isolation
- Universal modules with flexible I/O
- Detachable display allows monitoring of process values
- Universal power supply

State-of-the-Art EMC

Our SIL 2-certifed I.S. interfaces have far better EMC performance than required by the EMC directive (IEC 61326) and NAMUR NE21, as these interfaces also comply with IEC 61326-3-1 (EMC for functional safety).

Enclosure

DC power

I/O signal

Economical Reliable Flexible

Conditioning

I.S. solutions for global use
PR electronics' range of I.S. interfaces carries the following approvals: UL, IECEx, ATEX, FM, and GOST. This means that I.S. interfaces from PR electronics can be used all over the world.

The best I.S. technology on the market
All I.S. interfaces from PR electronics are intrinsically safe isolation barriers. This means that their circuits are energy-limited, so that any heat or sparks created in the hazardous area are insufficient to ignite an explosive atmosphere. Isolation barriers have many advantages over zener barriers, such as lower installation costs (no grounding is necessary), maintenance-free operation and prevention of ground loops and asymmetrical noise effects.

First with the latest technology

PRSIL2 CERTIFIED-COMPANY

At PR electronics we are traditionally among the first to implement the latest changes in directives and standards. So by choosing products from PR electronics, you are creating a future-orientated installation - both technically and environmentally.

At the forefront of company certifications
PR electronics was among the pioneers to obtain ATEX and IECEx company certifications. In 2008, we were certified according to IEC 61508 as a developer of modules for SIL 2 applications...one of the first electronics companies in the world to earn this certification.

Green production of red modules
Our production is 100% lead-free, and we are one of the first manufacturers in the electronics industry to comply with the RoHS directive aiming to protect the environment.

		IEC 61326		PR data sheet	
Phenomenon	Test standard	Test value	Criteria	Test value	Criteria
ESD	IEC 61000-4-2	4 kV/8kV Contact/Air	B	6 kV/8 kV Contact/Air	A 1.0%
HF field	IEC 61000-4-3	10 V/m 80...1000 MHz 3 V/m 1.4...2 GHz 1 V/m 2...2.7 GHz	A	20 V/m 80...1000 MHz 10 V/m 1.4...2 GHz 3 V/m 2...2.7 GHz	A 0.5%
Burst	IEC 61000-4-4	2 kV	B	4 kV	A 1.0%
Surge	IEC 61000-4-5	1 kV/2 kV, Diff./Comm. 0 Ω/10 Ω	B	1 kV/2 kV, Diff./Comm. 0 Ω / 10 Ω	A 1.0%
Conducted RF	IEC 61000-4-6	3 V, 150 kHz...80 MHz	A	10 V, 150 KHz...80 MHz	A 0.5%
Conducted LF	IEC 61000-4-16	Not required		15 Hz...150 KHz, 10 V 50 Hz, 300 Ω, 230 V	A 0.5%
Burst	IEC 61000-4-4	2 kV	B	2 kV	A 1.0%
Surge input	IEC 61000-4-5	1 kV/2 kV, Diff./Comm. 40 Ω	B	1 kV/2 kV Diff. /Comm. 40 Ω	B
Surge output	IEC 61000-4-5	1 kV/2 kV, Diff./Comm. 40 Ω	B	1 kV/2 kV Diff. /Comm. 40 Ω	A 1.0%
Conducted RF	IEC 61000-4-6	3 V	A	10 V 150 kHz...100 MHz	A 0.5%
Conducted LF	IEC 61000-4-16	Not required		15 Hz...150 KHz, 10 V 50 Hz, 300 Ω, 230 V	A 0.5%

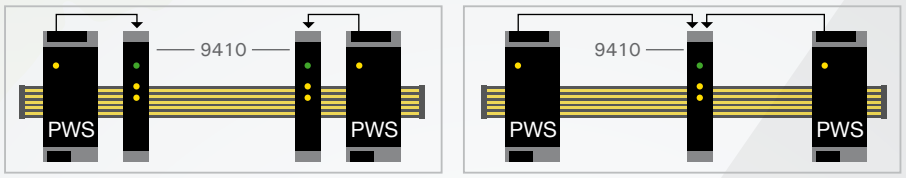
■ Better than IEC 61326 or NAMUR NE21

System 9000

The Right Way to Safety

The user-friendly and cost-effective product family for I.S. and SIL 2 applications

Two options for redundant power supply



HART® transparent modules

Allow direct access to 2-way communication with HART® units in the hazardous area.

Power Supply 9420

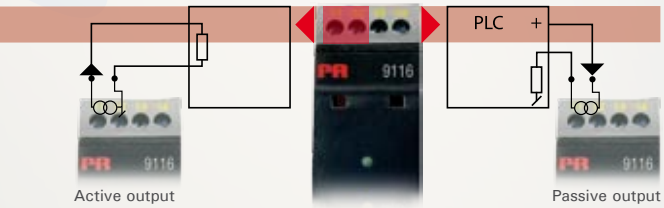
For mounting either in zone 2 / div. 2 or in the safe area.

HART 2-wire Tx input,1 & 2 ch.

HART mA output, 1 & 2 ch.

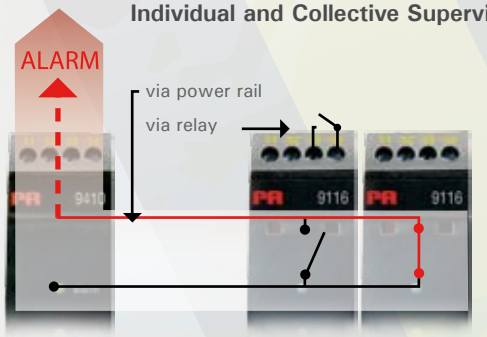
Temperature / mA input, 1 & 2 ch.

Automatic Output Configuration



The 9106, 9113 and 9116 modules detect if a source is connected in the output loop, and automatically provide an active or passive output as needed.

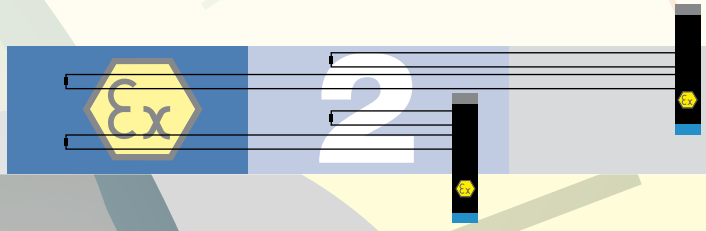
Individual and Collective Supervision



All of the I.S. interfaces have a status relay for individual supervision as well as a relay for collective supervision via the power rail. Both alarms are tripped in case of an error in supply, sensor, loop or hardware.

Economical Reliable Flexible

Installation areas: All the modules in the 9000 series can be installed in the safe area or in zone 2 / div.2



IEC 61508 - Functional Safety

Designed for Safety Applications

The I.S. interfaces in the 9000 series have been developed according to the international safety standard IEC 61508* in order to create a high level of functional safety. All the interfaces are certified to SIL 2 through a Full Assessment.

Certified Supplier of Functional Safety Products
PR electronics is certified to develop SIL 2 signal conditioning modules according to IEC 61508. Worldwide, only a small number of electronics manufacturers have achieved a similar approval of their working methods.

No Stone Left Unturned – No Corners Cut
We have followed the strictest procedures during development and verification of the 9000 series in relation to functional safety. Therefore, we are now able to offer the process industry the world's first cost-effective, front-programmable I.S. interfaces with SIL 2 certification based on a Full Assessment according to IEC 61508**.

This certification guarantees that the hardware development, software development, test methods and test results are in conformity with IEC 61508, and that the built-in safety concepts make the I.S. interfaces safe to use as part of a SIL 2 application.

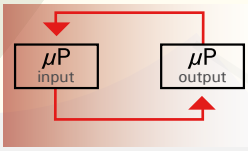
PR SIL 2 IEC 61508 CERTIFIED Full assessment

EXIDA FS CERTIFIED

* Functional safety of electrical, electronic and programmable electronic safety-related systems.

** Full Assessment, product certification and company certification have been carried out by an impartial third party, in this case exida; one of the world's top safety and reliability experts in functional safety of automation systems.

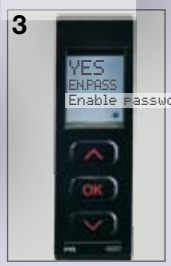
Increased Safety



Because of the safety concepts built into the I.S. interfaces, the user will achieve an increased level of safety. The diagram shows how the two µ-processors in a 9113 continuously supervise each other. In addition to this, RAM, Flash (CRC-16 check) and CPU are verified automatically and continuously during start-up and operation.

The Detachable Display of Unlimited Possibilities

Flexibility means easy, wide ranging configuration.
The 9000 series' detachable front display gives you:

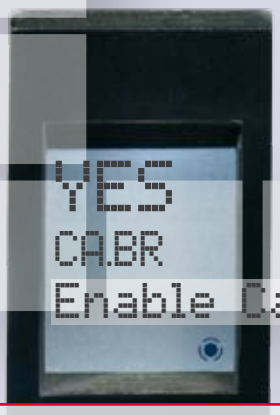


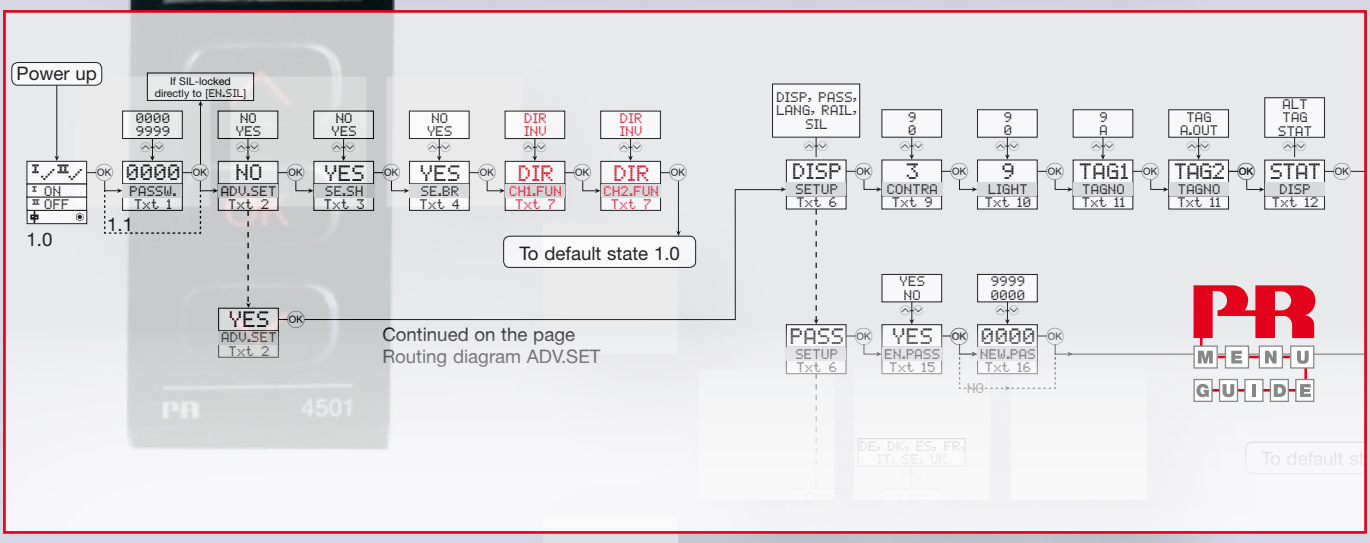
1 Fast and Easy Configuration
The programmable I.S. interfaces in the 9000 series are easily configured using the display, which guides you effortlessly through the menus with scrolling help texts in seven languages. All selections are made by way of the three push-buttons on the display, which means you don't have to deal with PCs, DIP-switches or jumpers.

2 Overview of the Process
When the detachable display is snapped onto the I.S. interface, the display shows process values, module status and indicates sensor errors or input signals outside the measurable range.

3 Password Protection
In order to protect the configuration against unauthorized changes, access to the menus can be blocked by a password.

4 Quick Copying of the Configuration
The display allows you to copy the configuration in no time from one module to others of the same type (9113, 9116).





Economical Reliable Flexible

I.S. Interfaces - Overview

Analog and Temperature Input

	5104B	5106B	5114B	5116B	9106B	9113B	9116B
TC/RTD			✓	✓		✓	✓
2-wire supply	✓	✓	✓	✓	✓		✓
Active mA input	✓	✓	✓	✓	✓	✓	✓
V input	✓	✓	✓	✓			✓
V output	✓	✓	✓	✓			
Active/passive output	✓	✓	✓	✓	Auto	Auto	Auto
Relay/Setpoint				2			1
Channels	1 & 2	1 & 2	1 & 2	1	1 & 2	1 & 2	1
Supply	Uni.	Uni.	Uni.	Uni.	24 V	24 V	24 V
Power rail					✓	✓	✓
HART® transparent		HART			HART		
SIL2					SIL2	SIL2	SIL2
SIL3					SIL3		
Programming	DIP	DIP	PC	PC	PR4501	PR4501	PR4501

Digital Input

	5202B	5202B4	9202B
NAMUR input	✓	✓	✓
Contact input	✓	✓	✓
Opto output	✓		✓
Relay outputs per channel	1	2	1
Channels	2	2	1 & 2
Supply	Uni.	Uni.	24 V
Power rail			✓
SIL2	SIL2	SIL2	SIL2
SIL3	SIL3	SIL3	
Programming	DIP	DIP	PR4501

f/I - f/f converter

5223B
✓
✓
✓
✓
1
Uni.
PC

Analog Output

	5105B	5107B	9107B
mA input	✓	✓	✓
V input	✓		
mA output	✓	✓	✓
V output	✓		
Channels	1 & 2	1 & 2	1 & 2
Supply	Uni.	Uni.	24 V
Power rail			✓
HART® transparent		HART	HART
SIL2			SIL2
SIL3			SIL3
Programming	DIP	DIP	PR4501

Digital Output

	5203B	9203B
NPN and PNP input	✓	✓
Contact input	✓	✓
Solenoid/alarm/LED driver	✓	✓
Channels	1 & 2	1 & 2
Supply	Uni.	24 V
Power rail		✓
SIL2		SIL2
Programming	DIP	PR4501

Input
Output
Other features

SIL2 Certified/Full assessment

SIL2 FMEDA report

SIL3 Certified/Full assessment. When a combination of 2 units/channels is used

SIL3 FMEDA report

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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