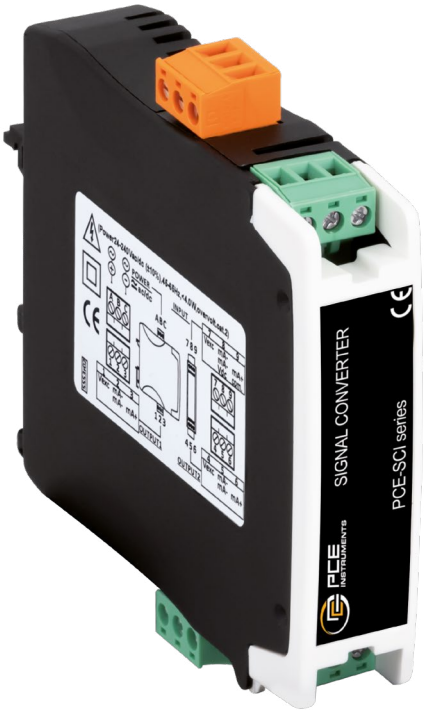
USER MANUAL

SIGNAL DUPLICATOR

PCE-SCI-D

ENGLISH



User manuals in various languages (français, italiano, español, português, nederlands, türk, polski) can be found via our product search on:
www.pce-instruments.com

INTRODUCTION

Signal duplicator and signal converter, for process signals, isolated, for industrial applications. Accepts process signals in 4/20 mA and 0/10 Vdc, provides excitation voltage if needed. Dual output with 4/20 mA signals. Isolated 4 ways between power, input signal, output 1 and output 2.
Universal power supply 24 to 240 Vac/dc ±10 %, isolated. Circuit isolation prevents ground loops and transient propagation, protecting remote equipment and signal integrity. Easy and fast configuration through configuration codes. Configuration system (digits and keypad) accessible behind the front cover. Integrated functions to generate low and high output signals, to validate remote instrumentation. Password function to block access to configuration.
Designed for industrial use, with potential integration into a wide range of applications, reduced cost, excellent quality and optional customization of the instrument.

INSTALLATION AND START-UP

If this is the first time you are configuring this instrument, below are the steps to follow to install and configure the instrument. Read all the manual sections in order to have a full and clear view of the characteristics of the instrument. Do not forget to read the installation precautions.

- Install the instrument at the DIN rail
- Connect the power supply (see Operate the configuration system for an explanation on normal mode of operation)
- Access the configuration system
- Configure the input signal and output signals
  choose an input and output signal configuration code
  introduce the code at the instrument
- Block access to the configuration system
- Connect the output signals
- Connect the input signal



When the marks **Attention** or **Risk of electrical shock** appear, read the documentation for information about the nature of the risk.

CONFIGURATION CODES

To activate the desired input and output signal ranges, activate the range configuration code into **configuration mode.**

Code	Input signal	Output 1	Output 2
10	4/20 mA	4/20 mA	4/20 mA
11	0/10 Vdc	4/20 mA	4/20 mA
12-14	[no function assigned]		
15	Function **password**		
16	Reset to default factory parameters		
17	Firmware version		
18	Working mode		
19	[no function assigned]		
---	Exit the menu without saving changes		

Codes with no function assigned will display message **nA** indicating the code is not available.

To select the **active** or **passive** mA versions at the input and output signals, configure the connection terminals as explained at Connections and dimensions.

TYPICAL APPLICATIONS

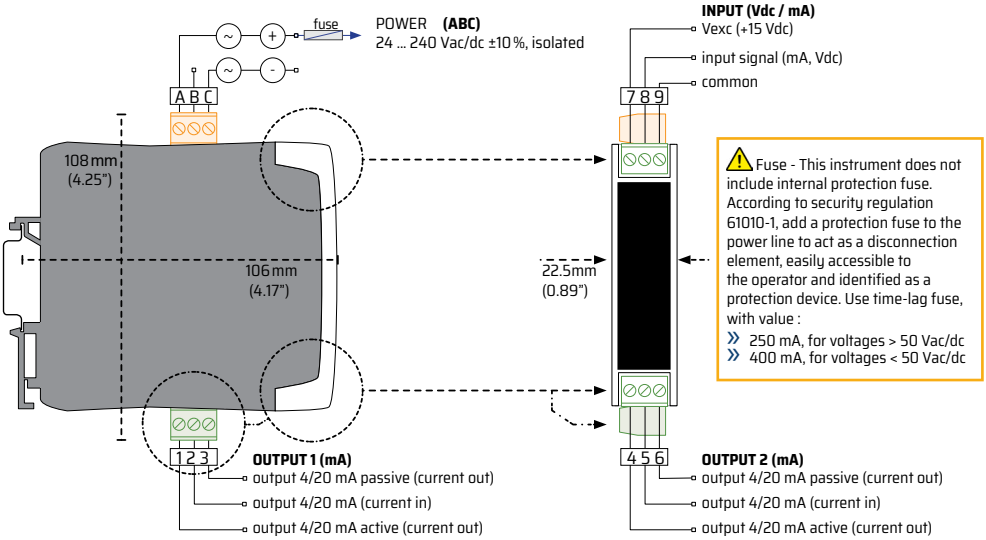
To measure process signals and provide dual outputs in standard 4/20 mA signals. Inputs and outputs are isolated. Single and dual signal retransmission to one or two remote acquisition devices (HMI, PLC, Scada). Local and remote verification of process values.

TECHNICAL SPECIFICATIONS

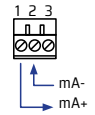
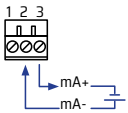
INPUT SIGNAL RANGES	
process	4/20 mA, 0/10 Vdc
type of signal	active and passive, the instrument provides excitation voltage to power the transducer.
excitation voltage	+15 Vdc, max. 25 mA, shortcircuit protected
input impedance (mA)	variable impedance, voltage drop on terminals <1.2 Vdc
input impedance (Vdc)	1 MOhm
maximum oversignal*	25 mA for mA 25 Vdc for Vdc
*maximum oversignal is the maximum signal accepted by the instrument. Higher signal values may cause instrument damage. Lower values are non destructive but may be out of accuracy specifications.	
ACCURACY AT 25 ºC	0.5 % F.S. for mA, 0.3 % F.S. for Vdc
THERMAL DRIFT	<100 ppm/º (F.S.)
STEP RESPONSE 0 to 99 % of signal	<200 mSec. in Mode 1, <550 mSec. in Mode 2
OUTPUT SIGNAL 1	
active 4/20 mA output	4/20 mA active, max. 20.5 mA, min. 3 mA, maximum load < 400 Ohm
passive 4/20 mA output	4/20 mA passive, max. 30 Vdc on terminals
OUTPUT SIGNAL 2	
active 4/20 mA output	4/20 mA active, max. 20.5 mA, min. 3 mA, maximum load < 400 Ohm
passive 4/20 mA output	4/20 mA passive, max. 30 Vdc on terminals
CONFIGURATION	
key pad	2 keys
display	2 digits, 7 segments, 5 mm height, red color

POWER SUPPLY	
voltage range	24 ... 240 Vac/dc ±10 %, isolated
AC frequency	45 ... 65 Hz
consumption	<4.0 W
power wires	1 mm² ... 2.5 mm² (AWG17 ... AWG14)
overvoltage category	2
ISOLATION 4 WAYS	
between all circuits	2300 Veff (60 seconds)
except for output 1 - output 2	1500 Vdc (60 seconds)
ENVIRONMENTAL	
IP protection	IP30
impact protection	IK06
operation temperature	0 ... +50 °C
storage temperature	-20 ... +70 °C
warm-up time	15 minutes
humidity	0 ... 95% non condensing
altitude	up to 2000 meters
MECHANICAL	
size	106 x 108 x 22.5 mm
mounting	standard DIN rail (35 x 7.5 mm)
connections	plug-in screw terminal (pitch 5.08 mm)
housing material	polyamide V0
weight	<150 grams
packaging	120 x 115 x 30 mm, cardboard

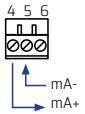
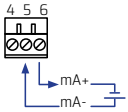
CONNECTIONS AND DIMENSIONS (MM/INCH)



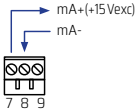
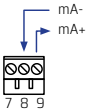
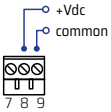
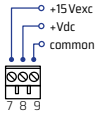
OUTPUT 1 signal connections

OUTPUT 1 signal	Output terminals			Connections
	1	2	3	
4/20 mA active output	Vexc (out)	mA- (in)		
4/20 mA passive output		mA- (in)	mA+ (out)	

OUTPUT 2 signal connections

OUTPUT 2 signal	Output terminals			Connections
	4	5	6	
4/20 mA active output	Vexc (out)	mA- (in)		
4/20 mA passive output		mA- (in)	mA+ (out)	

INPUT signal connections

INPUT signal	Input terminals			Connections
	7	8	9	
4/20 mA passive input	Vexc	mA-		
4/20 mA active input		mA-	mA+	
0/10 Vdc (2 wires)		+Vdc	common	
0/10 Vdc (3 wires)	Vexc	+Vdc	common	

ACTIVE AND PASSIVE SIGNALS
The instrument can be configured to measure process signals in 4/20 mA (active and passive) and 0/10 Vdc. The instrument has two outputs:
» output 1 is always fixed to 4/20 mA (active and passive).

» output 2 is always fixed to 4/20 mA (active and passive).

To select the active or passive mA versions at the input and output signals, configure the connection terminals according to your needs.
» active mA inputs are powered by an external element, and the instrument receives an active mA signal.

» passive mA inputs are powered by the instrument, by using the +15 Vdc (terminal 7) to power the transducer.

» active mA outputs are powered by the instrument.

» passive mA output are powered by an external element and the instrument only controls the value of the mA, but it does not provide power to the output loop.

ACCESS THE CONFIGURATION SYSTEM

ACCESS THE CONFIGURATION SYSTEM
1 - Remove the input signal terminal
» make sure that there are no dangerous voltages at the output signal terminals

2 - Open the front cover
3 - Configure the instrument
» locate the configuration digits

» locate the UP and SQ keys

BLOCK ACCESS TO THE CONFIGURATION SYSTEM
4 - Close the front cover
» remove the input signal terminal (if it was placed)

5 - Connect the input signal terminal
» when connected at place, check that the front cover can not be opened

» if they were removed, connect the two output signal terminals

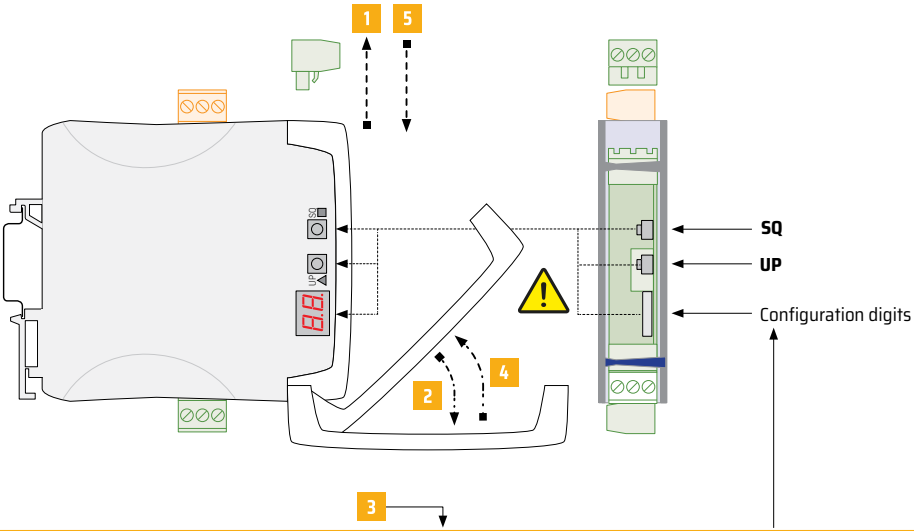


Opening the front cover reduces the security level. While front cover is open:
» the isolation between accessible parts and power supply is reduced from **reinforced** to **basic.**

» accessible parts are part of the input signal circuit.

» operations must be performed by qualified operators.

When correctly connected, the input signal terminal prevents the front cover from opening.



CONFIGURATION SYSTEM

» the configuration digits indicate the active input signal range

» keys UP and SQ to configure the instrument

OPERATE THE CONFIGURATION SYSTEM

CONFIGURATION SYSTEM

The Series PCE-SCI of isolated signal converters provide a fast and easy configuration system, based on function codes.

CONFIGURATION DIGITS

The instrument provides two numerical leds, to inform about the actual state of the instrument, active input and output signal ranges, and error codes.

CONFIGURATION KEYPAD

The configuration keypad is located inside the instrument, behind the removable front cover. To access the configuration keypad, remove the input signal terminal, and open the front cover. The instrument allows to password lock the keypad functions, by activating an access code (password function).

NORMAL MODE OF OPERATION

NORMAL MODE
When the power supply is connected, the instrument:
» activates the configuration digits, and displays the code for the actual configuration

» the instrument is in normal mode of operation

HOW TO ACCESS THE CONFIGURATION MODE AND THE TOOLS MENU
With the instrument in normal mode of operation, there is access to the configuration mode and the tools menu.
» to access the configuration mode, press the SQ key for 1 second

» to access the tools menu, press the UP key for 1 second

ECO FUNCTION (CONFIGURATION DIGITS ARE AUTOMATICALLY POWERED OFF)
If there is no interaction from the operator for 60 seconds, the instrument powers off the configuration digits. The decimal point remains active (flashing), indicating that the instrument is working correctly.

HOW TO POWER ON THE CONFIGURATION DIGITS
To power on the configuration digits, press one of the front keys SQ or UP. This will power on the configuration digits, and activate the normal mode of operation.

CONFIGURATION MODE

HOW TO ACCESS THE CONFIGURATION MODE
With the instrument in normal mode of operation, press for 1 second the SQ key. The horizontal leds light from bottom to top. When the upper led lights, the instrument activates the configuration mode.



If the key is released before activating the configuration mode, the horizontal leds light downwards from top to bottom, and the instrument returns to normal mode of operation. Inside the configuration mode the decimal point is not active.

Inside the configuration mode, the configuration digits display the code of the active configuration. Press the UP key to increase the code.
» press once to increase the value in +1

» maintain the key pressed to automatically increase the value

When the desired code is reached, press the SQ key. The leds light a round shape while new configuration is stored, and the instrument returns to normal mode of operation.



When exiting the configuration mode without changes (rollback activation, selection of inactive codes, etc), the horizontal leds light down from top to bottom, and the instrument returns to normal mode of operation.

ROLLBACK FUNCTION
If there is no interaction from the operator for 60 seconds, the instrument exits the configuration mode and returns to normal mode of operation, discarding changes.

TOOLS MENU

HOW TO ACCESS THE TOOLS MENU
With the instrument in normal mode of operation, press for 1 second the UP key. The horizontal leds light from bottom to top. When the upper led lights, the instrument activates the tools menu.



If the key is released before activating the tools menu, the horizontal leds light downwards from top to bottom, and the instrument returns to normal mode of operation.
Inside the tools menu, the decimal point is not active.

Inside the tools menu, the configuration digits indicate the first function available.
» press the UP key to move to the next function.

» press the SQ key to activate the selected function.

To exit the tools menu, press the UP key until the parameter **--** appears, and press the SQ key (or wait 60 seconds without pressing any key to wait for the automatic rollback).



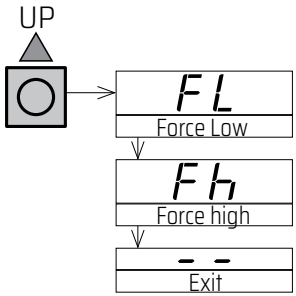
When exiting the tools menu, the horizontal leds light down from top to bottom, and the instrument returns to normal mode of operation.

ROLLBACK FUNCTION
If there is no interaction from the operator for 60 seconds, the instrument exits the tools menu and returns to normal mode of operation.

AVAILABLE FUNCTIONS
The Force low (FL) and Force high (Fh) functions allow to temporarily force the output signals to the low and high levels of the actual output signal ranges selected. These tools allow to easily validate the correct function of the remote elements connected to the instrument outputs.
» select Force low (FL) function to set both output signals to the minimum value of the selected ranges (4 mA). The **FL** flash message indicates that the function is active. Press any key to deactivate and return to the Force low (FL) menu entry.

» select Force high (Fh) function to set both output signal to the maximum value of the selected range (20 mA). The **Fh** flash message indicates that the function is active. Press any key to deactivate and return to the Force high (Fh) menu entry.

Tools menu
Press UP for 1 second to access the tools menu.



CONFIGURATION BLOCK (PASSWORD)

HOW TO BLOCK ACCESS TO CONFIGURATION MODE (PASSWORD)
Define a password code to prevent access to configuration mode and to tools menu to unauthorized operators. The password code will be requested when trying to access the configuration mode or the tools menu. To activate a password select code 15 inside the configuration mode.

The step-by-step process is indicated below:
» access the configuration mode

» access code 15

» press the SQ key to select

» the configuration digits indicate code **00** flashing

» press the UP key to select the desired code (for example 73)

» press the SQ key to validate or wait for the automatic rollback (60 seconds) to exit without changes

» the menu returns normal mode

Once the password code is applied, when a key is pressed, the configuration digits indicate code **00** flashing. Enter the password code to unlock access (code 73 in the previous example).

HOW TO DEACTIVATE THE PASSWORD
To deactivate the password, access again to code **15** and select value **00**. Press SQ key to confirm.

WORKING MODE

The instrument can be configured to work with a slower or faster mode.
The slower mode will have an improved accuracy in most of the working range. Configure code 18 Working mode and select the value to 01 for a standard response time of 200 mSec or select 02 for a response time of 550 mSec and an improved accuracy in most of the working range.

HOW TO SET THE WORKING MODE PARAMETER
To configure the working mode value, access code 18 inside the configuration mode. The step-by-step process is indicated below.

- access the configuration mode
- access code 18
- press the SQ key to select
- the configuration digits indicate code 01 flashing
- press the UP key, to select value 01 or 02
- press the SQ key to validate or wait for the automatic rollback (30 seconds) to exit without changes
- the menu returns normal mode

PRECAUTIONS ON INSTALLATION



Risk of electrical shock. Instrument terminals can be connected to dangerous voltage.



Instrument protected with double isolation. No earth connection required.



Instrument conforms to CE rules and regulations.

This instrument has been designed and verified conforming to the 61010-1 CE Security Regulation, for industrial applications. Installation of this instrument must be performed by qualified personnel only. This manual contains the appropriate information for the installation. Using the instrument in ways not specified by the manufacturer may lead to a reduction of the specified protection level. Disconnect the instrument from all external circuits before starting any maintenance and / or installation action.

The instrument does not have a general switch and will start operation as soon as power is connected. The instrument does not have protection fuse, the fuse must be added during installation.

The instrument is designed to be DIN rail mounted, inside a cabinet, protected from direct impacts. An appropriate ventilation of the instrument must be assured. Do not expose the instrument to excess of humidity. Maintain clean by using a humid rag and do NOT use abrasive products such as alcohols, solvents, etc. General recommendations for electrical installations apply, and for proper functionality we recommend: if possible, install the instrument far from electrical noise or magnetic field generators such as power relays, electrical motors, speed variators, ... If possible, do not install along the same conduits power cables (power, motor controllers, electrovalves, ...) together with signal and/ or control cables. Before proceeding to the power connection, verify that the voltage level available matches the power levels indicated in the label on the instrument. In case of fire, disconnect the instrument from the power line, fire alarm according to local rules, disconnect the air conditioning, attack fire with carbonic snow, never with water.



Conformity with security regulations EN-61010-1 requires that the front cover is closed. The input terminal prevents the front cover from opening.

FACTORY DEFAULT PARAMETERS

Displayed code		[10]
Input signal	4/20 mA	
Output signal 1	4/20 mA	
Output signal 2	4/20 mA	
Password code	disabled	[00]
Working mode	mode 1	[01]

RESET TO DEFAULT FACTORY PARAMETERS
To recover the instrument to default factory parameters, select code 16 and activate value 01.

- access the configuration mode
- access code 16 and press key SQ
- the configuration digits show code 00 flashing
- press key UP to change to value 01
- press key SQ
- the leds light a round shape while the new configuration is stored, and the instrument returns to normal mode of operation
- the configuration digits show code 10 and the default factory configuration is now active

FIRMWARE VERSION
The instrument firmware version is an alphanumerical code from 00 to FF, accessible through configuration code 17.

ERROR CODES

In case of error, the error code is shown flashing on the configuration digits. The error code is not visible inside configuration mode or inside the tools menu.
The error code remains active on display until the problem that caused the error is solved. In case of multiple error codes, solve the first problem to see the next active error code.

E1	**Password error** If password function is active, the password code entered is not correct.
E2	**Hardware overrange** Input signal is above the maximum readable signal (>20.5 mA, >10.5 Vdc). Output signal is fixed to 20.5 mA.
E3	**Hardware underrange** Input signal is below the minimum readable signal (<3.0 mA, <-0.3 Vdc). Output signal is fixed to 3 mA. Possible shortcircuit at input. Possible open circuit at input.
E4	Overload at the 4/20 mA input. The input signal detected is higher than 90 mA. The instrument self protection has opened the circuit. The instrument tries to reconnect every 1 second.

DISPOSAL

For the disposal of batteries in the EU, the (EU) 2023/1542 directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose. In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law. For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations. If you have any questions, please contact PCE Instruments.

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