MODEL · I3P
PROCESS & TEMPERATURES

Process | Temperature | Temperature | Temperature | Resistances | Potentiometer

Signal converter isolated, multisignal, for DIN rail mount.

Configurable to measure process (mA and Vdc, provides excitation voltage), thermocouples (J, K, N, E, T, R and S), Pt100 probes (2 and 3 wires), Pt500, Pt1000, Ni100, Ni1000, NTC, potentiometers and resistances.

Configurable output for 4/20 mA and 0/10 Vdc. Universal power supply from 18 to 265 Vac/dc. 3 way isolation between input, output and power circuits. Easy and fast configuration through configuration codes. Plug-in screw terminal connections.

Functions to generate low and high output signals, to validate remote instrumentation. '*Password*' function to block access to configuration. Designed for industrial environment, for a wide range of applications, reduced cost, excellent quality and optional customization. Recommended for OEM applications.

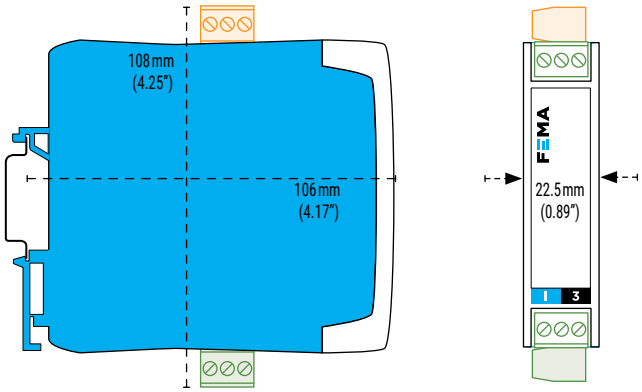
1. TECHNICAL SPECIFICATIONS

Input signal ranges	
process	4/20 mA, 0/10 Vdc (active and passive) excitation voltage +15 Vdc @30 mA
thermocouples	J, K, N, E, T, R and S (automatic compensation of the thermocouple cold junction)
'Pt' and 'Ni' probes	Pt100 (2 and 3 wires, automatic compensation up to 30 Ohm) Pt500, Pt1000, Ni100, Ni1000 (2 wires)
'NTC' probes	(see section 7)
resistances	ranges for 100 K, 50 K, 25 K, 10 K, 5 K and 2.5 KOhms
potentiometers	from 500 Ohm up to 20 KOhm potentiometers
Accuracy at 25 °C	(see Table 3)
Thermal stability	150 ppm/°C (F.S.)
Step response	<400 mSec. (0 % to 99 % signal)
Output signal ranges	
active mA signal	4/20 mA active, max. 22 mA, min. 1.5 mA, load < 400 Ohm
passive mA signal	4/20 mA passive, max. 30 Vdc on terminals
Vdc signal	0/10 Vdc, max. 11 Vdc, min. -1 Vdc, load > 10 KOhm
Configuration	
keypad	2 keys
display	2 digits, 7 segments, 5 mm height, red color
Power	
voltage range	18 to 265 Vac/dc isolated (20 to 240 Vac/dc ±10%)
AC frequency	45 to 65 Hz
consumption	<1.5 W
power wires	1 mm² to 2.5 mm² (AWG17 to AWG14)
overvoltage category	2
Isolation	
input - output	2300 Veff (60 seconds)
power - input	2300 Veff (60 seconds)
power - output	2300 Veff (60 seconds)
IP protection	IP30
Impact protection	IK06
Temperature	
operation	from 0 to +50 °C
storage	from -20 to +70 °C
'warm-up' time	15 minutes
Mechanical	
size	106 x 108 x 22.5 mm
mounting	standard DIN rail (35 x 7.5 mm)
connections	plug-in screw terminals (pitch 5.08 mm)
housing material	polyamide V0
weight	<150 grams
packaging	120 x 115 x 30 mm, cardboard

2. HOW TO ORDER

I3P	Process and temperature signal converter
I3P.1442	Process and temperature signal converter with custom features

3. DIMENSIONS



4. FUNCTIONS INCLUDED

Function '**Force Low**' . . . temporarily forces the signal output to the minimum of the selected range (4 mA or 0 Vdc). Tool to validate the function of the remote elements connected to the output.

Function '**Force High**' . . . temporarily forces the signal output to the maximum of the selected range (20 mA or 10 Vdc). Tool to validate the function of the remote elements connected to the output.

Function '**Password**' . . . prevents access from unauthorized operators to '*configuration mode*' and '*tools*' menu.

5. CONNECTIONS: INPUT & OUTPUT

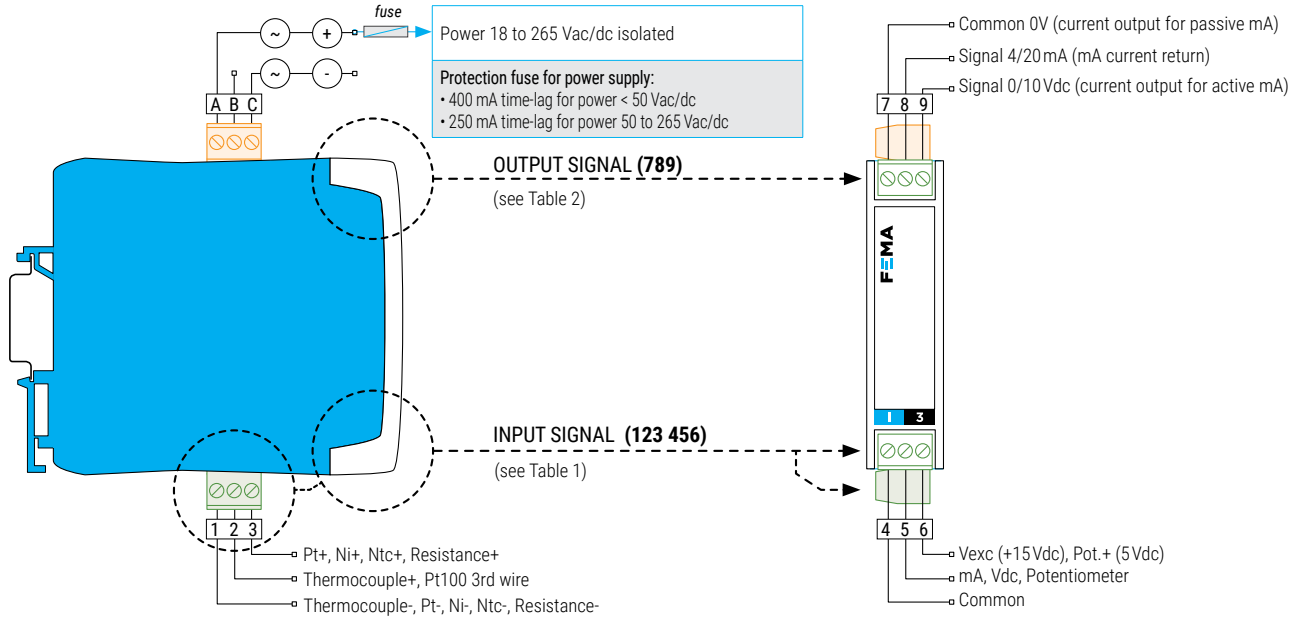
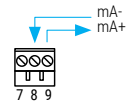
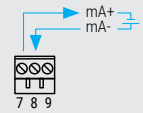
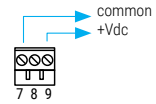


Table 1 | **INPUT signal connections**

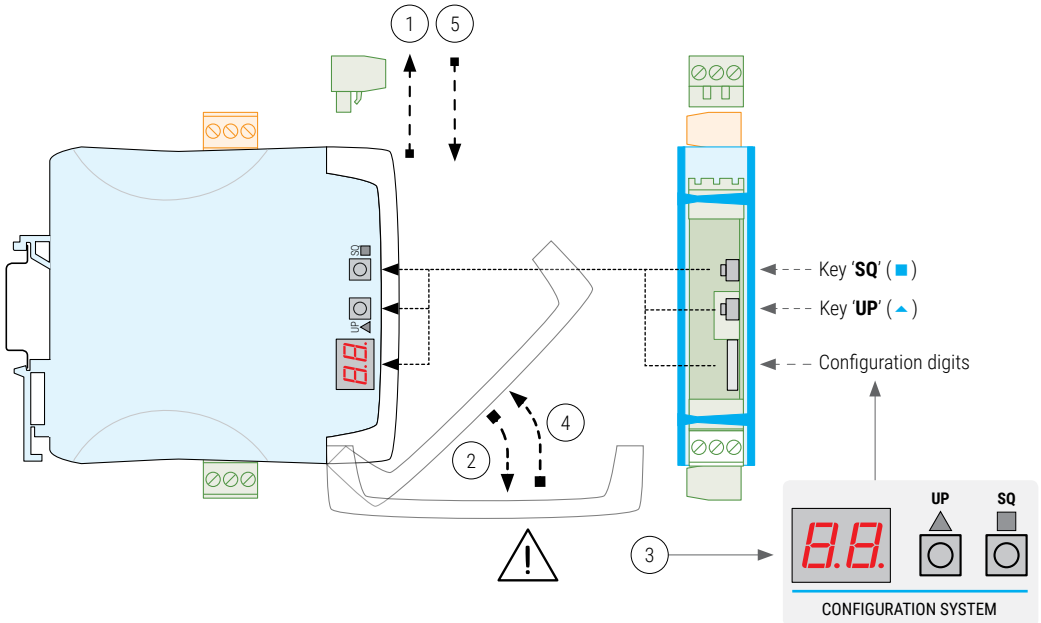
Input signal	Input terminals 1	2	3	4	5	6
4/20 mA passive					mA-	Vexc
4/20 mA active				mA-	mA+	
0/10 Vdc				common	+Vdc	
0/10 Vdc with Vexc				common	+Vdc	Vexc
Potentiometer				Pot.-	Potent.	Pot.+
Resistance	Res-		Res+			
NTC	NTC-		NTC+			
Thermocouple	tc-	tc+				
Pt100 (3 wires)	Pt-	Pt- (3r wire)	Pt+			
Pt100 (2 wires)	Pt- (shortcircuit 1 and 2)		Pt+			
Pt1000, Pt500	Pt-		Pt+			
Ni100, Ni1000	Ni-		Ni+			

Table 2 | **OUTPUT signal connections**

Output signal	Output terminals 7	8	9	Connections
4/20 mA active		mA- (in)	mA+ (out)	
4/20 mA passive	mA+ (out)	mA- (in)		
0/10 Vdc	common		+Vdc	

6. Configuration system

1. Remove the output signal terminal
2. Open the front cover
3. Configure the instrument
4. Close the front cover
5. Place the output signal terminal



Opening the front cover reduces the security level of the operator. If dangerous voltages are connected to any of the input terminals, remove both input signal terminals before opening the front cover. Operation must be performed by qualified personnel.

7. CONFIGURATION CODES - INPUT AND OUTPUT SIGNAL RANGES

To activate one of the input signal ranges (see Table 3) access the '**configuration system**' (see section 6). To access the '**configuration menu**' press the '**SQ'** (▲) key, press the '**UP**' (▲) key to select the desired code, and validate with the '**SQ'** (■) key.

To configure the output signal range to 4/20 mA and 0/10 Vdc, press both keys '**UP**' (▲) and '**SQ'** (■). The actual output signal configuration is identified with the active decimal point (decimal point to the right for 4/20 mA, decimal point to the left for 0/10 Vdc).

For detailed description, see the '*User's manual*' (see section 8).

OUTPUT 0/10 Vdc
(left decimal point)

OUTPUT 4/20 mA
(right decimal point)

Table 3 | **Input signal - Configuration codes**

Code	Input signal range		Technical specs. *(**max. voltage drop on terminals)*
00 a 09	[no function assigned]		---
10	4/20 mA	Process	error <0.30% FS (max. 25 mA; V_{term}<2 Vdc**)
11	0/10 Vdc		error <0.30% FS (max. 25 Vdc; Zin=1 MΩ)
12	0/100 %	Potentiometer	total error <1.0 % FS
13	0/100 KOhm	Resistance	total error <0.7 % FS
14	0/50 KOhm		total error <0.7 % FS
15	0/25 KOhm		total error <0.7 % FS
16	0/10 KOhm		total error <0.7 % FS
17	0/5 KOhm		total error <0.7 % FS
18	0/2.5 KOhm		total error <0.7 % FS
19	0/1200 °C	Thermocouple J (cold junction error included)	total error <0.5% FS
20	0/1000 °C		total error <0.5% FS
21	0/800 °C		total error <0.5% FS
22	0/600 °C		total error <0.5% FS
23	0/450 °C		total error <0.7% FS
24	0/300 °C		total error <1.5% FS
25	0/150 °C		total error <2.5% FS
26	0/1350 °C	Thermocouple K (cold junction error included)	total error <0.5% FS
27	0/1000 °C		total error <0.5% FS
28	0/800 °C		total error <0.5% FS
29	0/600 °C		total error <0.7% FS
30	0/450 °C		total error <1.0% FS
31	0/300 °C		total error <2.0% FS
32	0/150 °C		total error <3.5% FS
33	0/1300 °C	Thermocouple N (cold junction error included)	total error <0.5% FS
34	0/1000 °C		total error <0.5% FS
35	0/800 °C		total error <0.5% FS
36	0/600 °C		total error <0.7% FS
37	0/450 °C		total error <1.5% FS
38	0/300 °C		total error <2.0% FS
39	0/150 °C		total error <3.5% FS
40	[no function assigned]		---
41	0/900 °C	Thermocouple E (cold junction error included)	total error <0.5% FS
42	0/600 °C		total error <0.5% FS
43	0/450 °C		total error <0.5% FS

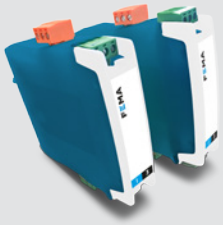
Table 3 | **Input signal - Configuration codes**

Code	Input signal range		Technical specs. *(**max. voltage drop on terminals)*
44	0/300 °C	Thermocouple E (cold junction error included)	total error <0.7% FS
45	0/150 °C		total error <2.0% FS
46	0/400 °C	Thermocouple T (cold junction error included)	total error <1.0 % FS
47	0/300 °C		total error <1.3 % FS
48	0/200 °C		total error <2.0 % FS
49	0/100 °C		total error <4.0 % FS
50	0/1750 °C	Thermocouple R (cold junction error included)	total error <1.0 % FS
51	0/1500 °C		total error <1.0 % FS
52	0/1200 °C		total error <1.5 % FS
53	0/900 °C		total error <2.0 % FS
54	0/1750 °C	Thermocouple S (cold junction error included)	total error <1.0 % FS
55	0/1500 °C		total error <1.0 % FS
56	0/1200 °C		total error <1.5 % FS
57	0/900 °C		total error <2.0 % FS
58	[no function assigned]		---
59	0/700 °C	Pt100	total error <0.5 % FS
60	0/600 °C		total error <0.5 % FS
61	0/500 °C		total error <0.6 % FS
62	0/400 °C		total error <0.6 % FS
63	0/300 °C		total error <0.7 % FS
64	0/200 °C		total error <1.0 % FS
65	0/100 °C		total error <1.5 % FS
66	-50/+50 °C		total error <1.5 % FS
67	-100/+100 °C		total error <1.0 % FS
68	-200/+200 °C		total error <0.5 % FS
69	0/630 °C	Pt500	total error <0.7 % FS
70	0/300 °C		total error <0.7 % FS
71	-150/150 °C		total error <0.7 % FS
72	0/630 °C	Pt1000	total error <1.0 % FS
73	0/300 °C		total error <0.7 % FS
74	-150/150 °C		total error <0.7 % FS
75	-60/180 °C	Ni100	total error <0.7 % FS
76	[no function assigned]		
77	-60/180 °C	Ni1000	total error <0.7 % FS
78 to 79	[no function assigned]		---
80	-50/50 °C	NTC (R_{25}=10K and β=3500)	total error <0.7 % FS
81	0/90 °C	NTC (R_{25}=10K and β=3500)	total error <1.0 % FS
82	-50/50 °C	NTC (44006)	total error <0.7 % FS
83	0/90 °C	NTC (44006)	total error <1.3 % FS
84 to 94	[no function assigned]		---
95	Function 'password'		---
96	Pt100 'Alpha' (01=0.0385, 02=0.0390)		---
97	Factory default configuration		---
98	Firmware version		---
98 to 99	[no function assigned]		---
---	Exit the menu and discard changes		---

8. ADDITIONAL DOCUMENTATION

User's manual	www.fema.es/docs/4788_I3P_manual_en.pdf
Datasheet	www.fema.es/docs/4790_I3P_datasheet_en.pdf
Quick installation guide	www.fema.es/docs/4792_I3P_installation_en.pdf
Web	www.fema.es/docs/Serie_I3

9. OTHER SIGNAL CONVERTERS ... AND MORE



SERIES I3
Section **OEM**

output signal . . . . . 4/20 mA, 0/10 Vdc
configuration . . . . . by codes (inside)
isolation . . . . . 3 ways

SERIES I4
FULLY CONFIGURABLE

output signal . . . . . 4/20 mA, 0/10 Vdc, ...
configuration . . . . . by menu (front)
isolation . . . . . 3 ways

SERIES I5
FIELD BUS

output signal . . . . . Modbus RTU, CANbus, ...
configuration . . . . . by menu (front)
isolation . . . . . 3 ways

SERIES B
LARGE FORMAT DISPLAYS

digit . . . . . 60 and 100 mm
reading . . . . . 25 and 50 meters
mounting . . . . . wall, panel, hanging
housing . . . . . metallic IP65

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Potentiometer | Temperature | Period | Adc | Vdc | Resistances
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