

MODEL · 14L

LOAD CELLS
AND MILLIVOLTS**Signal converter for load cell and millivolts signals, isolated, for DIN rail mount.**

Isolated signal converter for load cell signals and millivolts. Provides +5Vdc excitation voltage to power the load cell, and 'sense' function to compensate for excitation voltage variations. Accepts direct connection of 1, 2, 3 or up to 4 load cells (typical 350 Ohms load cells). Accepts 4 and 6 wire load cells. Accepts unipolar and bipolar ranges up to ± 80 mV. Output signal configurable for 4/20mA (active or passive) and 0/10Vdc. Universal power supply from 18 to 265Vac/dc. 3 way isolation between input, output and power circuits. Plug-in screw terminal connections. Circuit isolation prevents ground loops and transient propagation, protecting remote equipment and signal integrity.

Two configuration modes: ⁽¹⁾ easy and fast using predefined configuration codes, and ⁽²⁾ advanced configuration through the 'configuration menu' to customize input and output signal ranges. Configuration through front push-button keypad and front display. 'Tare' function accessible from front key pad. Configurable display information (tare value, input signal value, output signal value, configured label, signal percentage, process value, excitation voltage and excitation current values). Manual 'force' functions to generate low and high output signals, to validate remote instrumentation during installation. 'Password' function to block non-authorized access to configuration menu. 'SOS' mode to help on critical maintenance and repairs without affecting the manufacturing process. Designed for industrial use, with potential integration into a wide range of applications, excellent quality and optional customization.



1. TECHNICAL SPECIFICATIONS

Input signal ranges for load cells

signal ranges	from 0/5 mV up to 0/80 mV
bipolar signal ranges	from ± 5 mV up to ± 80 mV
excitation voltage	+5Vdc
excitation voltage variations	automatic compensation
excitation current	max. 70 mA

Input signal ranges for millivolts

signal ranges	from 0/5 mV up to 0/80 mV
bipolar signal ranges	from ± 5 mV up to ± 80 mV
excitation voltage	no
input impedance	10 MOhm typical (with 1 MOhms during 150 milliseconds, every 10 seconds approx.)

Accuracy at 25 °C*

see section 7 for each type of signal
*values for 4/20 mA output, for 0/10 Vdc output, add +0.05 % to indicated accuracy.

Thermal stability

± 150 ppm/°C (F.S.) for ranges up to 5 mV
± 100 ppm/°C (F.S.) for ranges up to 20 mV
± 75 ppm/°C (F.S.) for ranges up to 80 mV

Step response

with 'no filter'	<115 mSec. typ. (0 % to 99 % signal)
with '50 Hz filter' or '60 Hz filter'	<150 mSec. typ. (0 % to 99 % signal)
with '50 and 60 Hz filter'	<300 mSec. typ. (0 % to 99 % signal)

Output signal ranges

active current output	4/20 mA active, max. <22 mA, min. 0 mA, load < 400 Ohm
passive current output	4/20 mA passive, max. 30 Vdc on terminals
voltage output	0/10 Vdc, max. <11 Vdc, min. -0.05 Vdc (typ.), load > 10 KOhm
* custom input and output ranges through the 'configuration menu' (for example: 4/12 mA, 0/5 Vdc, 20/4 mA, etc)	

Configuration system

key pad + display	accessible at the front of the instrument
configuration modes	⁽¹⁾ through preconfigured codes, ⁽²⁾ through 'configuration menu'

Power supply

voltage range	18 to 265 Vac/dc isolated (20 to 240 Vac/dc $\pm 10\%$)
AC frequency	45 to 65 Hz
consumption	<3.0 W
power wires	1 mm ² to 2.5 mm ² (AWG17 to AWG14)
overvoltage category	2

Isolation

input - output	3000 Veff (60 seconds)
power - input	3000 Veff (60 seconds)
power - output	3000 Veff (60 seconds)

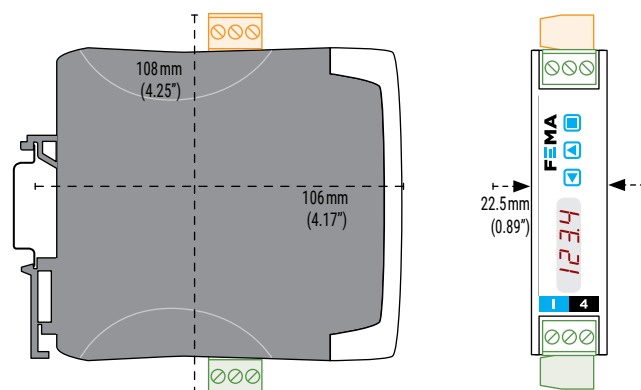
Environmental

IP protection	IP30
impact protection	IK06
operation temperature	from 0 to +50 °C
storage temperature	from -20 to +70 °C
'warm-up' time	15 minutes
humidity	0 to 95 % non condensing
altitude	up to 2000 meters

2. HOW TO ORDER

14L	Load cell signal converter
14L.1442	Load cell signal converter with custom features

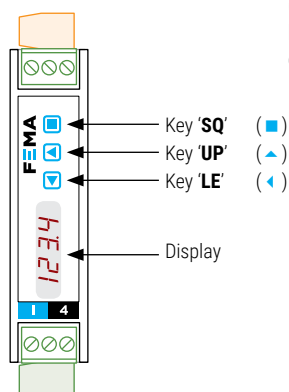
3. DIMENSIONS

**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

4. CONFIGURATION SYSTEM

The instrument allows for 2 configuration modes: ⁽¹⁾ easy and fast using predefined configuration codes, and ⁽²⁾ advanced configuration through the 'configuration menu'. Configuration is applied through the 3 push button keypad and the 4 red digit led display at the front of the instrument.



6. CONNECTIONS: INPUT & OUTPUT

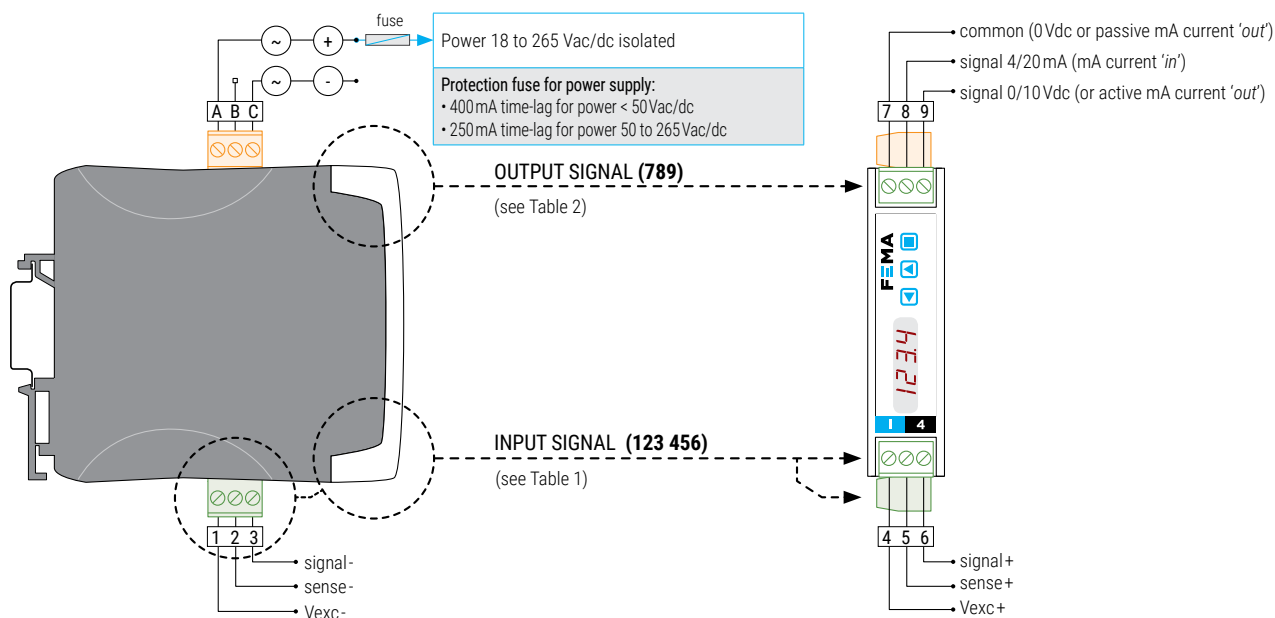


Table 1 | INPUT signal connections

Input signal	1	2	3	4	5	6
load cell	Vexc-	sense-	signal-	Vexc+	sense+	signal+
millivolts			mV-			mV+

Table 2 | OUTPUT signal connections

Output signal	7	8	9	Connections
4/20mA active output		mA- (in)	mA+ (out)	
4/20mA passive output* (*external loop power needed).	mA+ (out)	mA- (in)		
0/10Vdc	common		+Vdc	

5. FUNCTIONS INCLUDED

- 'Force' functions temporarily forces the signal output to the minimum ('Force Low'), to the maximum ('Force High') or to a selectable value ('Force Set'), to validate the function of the remote elements connected to the output during installation.
- 'Label' function configure an alphanumerical label to be shown on display, and easily identify each unit.
- 'SOS' mode manually set the output to a fixed value, to apply critical maintenance or repairs to the input signal section without affecting the manufacturing process.
- 'Messages' function configure information to display at your request at front key 'LE' (◀). See real time values for input signal, output signal, input percentage, process value or configured label.
- 'On error' function configure the output response in case of error at the input.
- 'Password' function prevents access from unauthorized operators to 'configuration menu'.

7. PRECONFIGURED SIGNAL RANGES AND TYPICAL APPLICATIONS

The instrument has 2 different configuration modes: ⁽¹⁾easy and fast using predefined configuration codes, and ⁽²⁾advanced configuration through the 'configuration menu'.

The tables below provide a list of preconfigured input signal ranges, together with technical specifications for each range, and the associated preconfiguration codes.

Custom configurations

The 'configuration menu' allows to configure custom ranges for both the input and the output ranges. For additional information see the 'User's Manual' (see section 8).

Typical applications

- load cells that provide a 1 mV/V, 2 mV/V or 3 mV/V signals and can be powered from the instrument +5Vdc excitation voltage.



INPUT and OUTPUT signals fully configurable through the configuration menu (see the *User's Manual* at section 8).

Table 3 | Input ranges and technical specifications for load cell signals

Sensor	Code for 4/20 mA output	Code for 0/10 Vdc output	Accuracy (%FS)	Max. oversignal	Zin
0/5mV	010	110	<0.18 %	±12 Vdc	20 MOhm
0/10mV	011	111	<0.13 %	±12 Vdc	20 MOhm
0/15mV	012	112	<0.13 %	±12 Vdc	20 MOhm
0/20mV	013	113	<0.10 %	±12 Vdc	20 MOhm
0/25mV	014	114	<0.10 %	±12 Vdc	20 MOhm
0/30mV	015	115	<0.10 %	±12 Vdc	20 MOhm
0/40mV	016	116	<0.10 %	±12 Vdc	20 MOhm
0/50mV	017	117	<0.08 %	±12 Vdc	20 MOhm
0/60mV	018	118	<0.08 %	±12 Vdc	20 MOhm
0/70mV	019	119	<0.08 %	±12 Vdc	20 MOhm
0/80mV	120	120	<0.08 %	±12 Vdc	20 MOhm
±5mV	121	121	<0.15 %	±12 Vdc	20 MOhm
±10mV	122	122	<0.10 %	±12 Vdc	20 MOhm
±20mV	123	123	<0.10 %	±12 Vdc	20 MOhm
±30mV	124	124	<0.10 %	±12 Vdc	20 MOhm
±40mV	125	125	<0.08 %	±12 Vdc	20 MOhm
±50mV	126	126	<0.08 %	±12 Vdc	20 MOhm
±60mV	127	127	<0.08 %	±12 Vdc	20 MOhm
±70mV	128	128	<0.08 %	±12 Vdc	20 MOhm
±80mV	129	129	<0.08 %	±12 Vdc	20 MOhm

Table 4 | Input ranges and technical specifications for millivolt signals

Sensor	Code for 4/20 mA output	Code for 0/10 Vdc output	Accuracy (%FS)	Max. oversignal	Zin
0/5mV	050	150	<0.15 %	±12 Vdc	10 MOhm
0/10mV	051	151	<0.10 %	±12 Vdc	10 MOhm
0/15mV	052	152	<0.10 %	±12 Vdc	10 MOhm
0/20mV	053	153	<0.07 %	±12 Vdc	10 MOhm
0/25mV	054	154	<0.07 %	±12 Vdc	10 MOhm
0/30mV	055	155	<0.07 %	±12 Vdc	10 MOhm
0/40mV	056	156	<0.05 %	±12 Vdc	10 MOhm
0/50mV	057	157	<0.05 %	±12 Vdc	10 MOhm
0/60mV	058	158	<0.05 %	±12 Vdc	10 MOhm
0/70mV	059	159	<0.05 %	±12 Vdc	10 MOhm
0/80mV	060	160	<0.05 %	±12 Vdc	10 MOhm
±5mV	061	161	<0.12 %	±12 Vdc	10 MOhm
±10mV	062	162	<0.07 %	±12 Vdc	10 MOhm
±20mV	063	163	<0.07 %	±12 Vdc	10 MOhm
±30mV	064	164	<0.07 %	±12 Vdc	10 MOhm
±40mV	065	165	<0.05 %	±12 Vdc	10 MOhm
±50mV	066	166	<0.05 %	±12 Vdc	10 MOhm
±60mV	067	167	<0.05 %	±12 Vdc	10 MOhm
±70mV	068	168	<0.05 %	±12 Vdc	10 MOhm
±80mV	069	169	<0.05 %	±12 Vdc	10 MOhm

8. ADDITIONAL DOCUMENTATION

User's manual

www.fema.es/docs/5583_I4L_manual_en.pdf

Datasheet

www.fema.es/docs/5585_I4L_datasheet_en.pdf

Quick installation guide

www.fema.es/docs/5587_I4L_installation_en.pdf

Web

www.fema.es/docs/Series_I4

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 menu (front keypad)
isolation 3 ways



SERIES I5

FIELD BUS

output signal Modbus RTU, CANbus, ...
configuration by menu (front keypad)
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

50

YEARS

1969-2019

Q

ISO 9001

Certified Quality

CE

EN-61010-1

Security

CE

EN-61326-1

Electromagnetic C.

5

YEARS

Extended Warranty

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Process



Temperature



Counter



Weight



Flow



Time



Frequency



Temperature



Speed



Vac



Aac



Integrators



Potentiometer



Temperature



Period



Adc



Vdc



Resistances



Digital



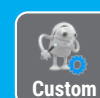
Digital



Digital



Digital



Custom