

## 2-WIRE PROGRAMMABLE TRANSMITTER



- Ingressi per RTD, TC, mV, linear resistance mA, and V
- Isolamento galvanico 3,75 kVAC
- 4...20 mA loop output
- Versione a singolo o doppio canale
- ATEX Ex version
- DIN rail mounting



### Application:

Electronic temperature measurement with resistance sensor or thermocouple sensor. • Ex barrier for temperature sensors, potentiometers and current / voltage signals. • Conversion of current signals from supplied transmitters to 2-wire 4...20 mA signals. • Amplification of mV signals. • Conversion of linear resistance variation. • Galvanic isolation of analogue signals. • Measurement of floating signals. • Linearisation of non-linear Ohm, mV, mA, or voltage signals. • Separation of circuits in PELV/SELV installations.

### Technical characteristics:

The unit is based on a microprocessor core with an efficient program operation. The basic calibration data and present set-up are stored in an EEPROM thereby avoiding the loss or change of data at power off. The 2-channel version has a full galvanic isolation between the channels. By way of a jumper on the PCB, the input in the standard version can be programmed either for a temperature or a current / voltage input. This means that one channel can work as for instance a temperature transmitter and the other can work as an isolation amplifier. Measurement range, signal parameters, and output span are configured to the present task by way of a Windows® 95/98-based PC and PR electronics A/S' communications interface Loop Link 5905.

### Input types:

#### Temperature input - jumper in position 1:

**Thermocouple input (TC)** for standard thermocouples type B, E, J, K, L, N, R, S, T, U, W3, W5 according to the norms IEC 584, DIN 43710 and ASTM E988-90.

The CJC can be selected in 3 different ways: internally in the terminal, externally by way of a Pt100/Ni100 sensor, or externally with a constant temperature. If internal compensation is selected, a terminal with a built-in temperature sensor must be ordered separately (PR type no. 5910 and 5913). Sensor error detection is available.

**RTD input** for Pt100...Pt1000 according to the norm IEC 751 and Ni100...Ni1000 according to the norm DIN 43760. Automatic cable compensation at a 3 or 4-wire connection. At a 2-wire connection, the cable resistance can be entered or measured by the configuration program and sent to the module which then compensates by the entered cable resistance. Sensor error detection is available.

**Resistance input** for resistance measurement with cable compensation as described under the RTD input. Sensor error detection is available.

**The mV input** is programmable in the range 0...100 mV.

### Current / voltage input - jumper in position 2:

**The current input** is programmable in the range 0...100 mA, for instance 4...20 mA.

**The voltage input** is programmable in the range 0...250 VDC.

### Output:

Standard loop 4...20 mA current output. The output signal is proportional and linear to the value of the input signal. Special set-ups can be selected in the configuration program, for instance a customised linearisation, a reversed output, a limiter according to the selected output span, and selection of an output value in case of a sensor error. Maximum load on the current output is 1375  $\Omega$ .

### Sensor error detection:

The output can be set up at a RTD-, thermocouple and linear resistance input to go *to max.*, *to min.*, *entered value*, NAMUR NE43 *Upscale* or *Downscale* at sensor error detection.

### Configuration:

The transmitter is configured to the present task by way of a Windows® 95/98-based PC and PR electronics A/S' communications interface Loop Link 5905. The transmitter can be configured with or without a connected supply voltage as the communications interface supplies the necessary voltage to the set-up. The communications interface is galvanically isolated to protect the PC port RS232. Communication is 2-way to allow the retrieval of the transmitter set-up into the PC and to allow the transmission of the PC set-up to the transmitter. For users who do not wish to do the set-up themselves, the 5131 can be delivered configured according to customer specifications: input type, measurement range, sensor error detection, and output signal.

## Specifiche tecniche:

### Range delle specifiche:

-20°C fino a +60°C

### Specifiche comuni:

Alimentazione .....	7,5...35 VDC
Fusibile .....	50 mA SB / 250 VAC
Consumo durante la programmazione .....	3...8 mA
Isolamento, test/operation .....	3,75 kVAC / 250 VAC
Interfaccia di comunicazione .....	Loop Link 5905
Rapporto segnale/disturbo .....	Min. 60 dB (0...100 kHz)
Segnale dinamico, ingresso .....	22 bit
Segnale dinamico, uscita .....	16 bit
Tempo di aggiornamento:	
Ingresso per temperatura .....	115 ms
Ingresso mA / V / mV .....	75 ms
Tempo di risposta (0...90%, 100...10%) programmabile:	
Ingresso per temperatura .....	400 ms...60 s
Ingresso mA / V / mV .....	250 ms...60 s
Temperatura di calibrazione .....	20...28°C
Precisione, la maggiore dei valori generali e di base:	

### Valori generali

Tipo ingressi	Accuratezza	Coeff. temperatura
Tutti	≤ ±0,05% d. campo	≤ ±0,01% d. campo / °C

### Valori di base

Tipo ingresso	Accuratezza	Coeff. temperatura
mA	≤ ±4 µA	≤ ±0,4 µA/°C
Volt	≤ ±10 µV	≤ ±1 µV/°C
RTD	≤ ±0,2°C	≤ ±0,01°C/°C
Lin.R	≤ ±0,1 Ω	≤ ±10 mΩ/°C
Tipo TC:		
E, J, K, L, N, T, U	≤ ±1°C	≤ ±0,05°C/°C
Tipo TC:		
B, R, S, W3, W5	≤ ±2°C	≤ ±0,2°C/°C

Influenza sull'immunità-EMC.....	< ±0,5% d. campo
Estensione sull'immunità EMC:	
NAMUR NE 21, A criterion, burst.....	< ±1% del campo

Effetti sul cambio dell'alimentazione..	< 0,005% d. campo / VDC
Dimensione filo (max.) .....	1 x 2,5 mm <sup>2</sup> cavo multi-polare
Torsione dei contatti .....	0,5 Nm
Umidità .....	< 95% RH (non-cond.)
Dimensioni (AxLxP) .....	109 x 23,5 x 130 mm
Tipo DIN-Rail .....	DIN 46277
Protezione (custodia / contatti) .....	IP50 / IP20
Peso .....	195 g

### Specifiche elettriche, ingresso per temperatura:

Tipo	Temperatura min.	Temperatura max.	Campo min.	Norm
B	+400°C	+1820°C	200°C	IEC584
E	-100°C	+1000°C	50°C	IEC584
J	-100°C	+1200°C	50°C	IEC584
K	-180°C	+1372°C	50°C	IEC584
L	-100°C	+900°C	50°C	DIN 43710
N	-180°C	+1300°C	100°C	IEC584
R	-50°C	+1760°C	200°C	IEC584
S	-50°C	+1760°C	200°C	IEC584
T	-200°C	+400°C	50°C	IEC584
U	-200°C	+600°C	75°C	DIN 43710
W3	0°C	+2300°C	200°C	ASTM E988-90
W5	0°C	+2300°C	200°C	ASTM E988-90

### Ingresso TC:

Max. offset.....	50% del max. val. selez.
Corrente di sensor error .....	Nom. 30 µA
CJC .....	≤ ±1°C
Rilevamento errore del sensore.....	Si

### Ingresso mV:

Range di misura .....	0...100 mV
Min. range di misura.....	5 mV
Max. offset.....	50% del max. val. selez.
Resistenza d'ingresso .....	Nom. 10 MΩ

### RTD e ingresso resistenza lineare:

Tipo	Valore min.	Valore max.	Campo min.	Norm
Pt100	-200°C	+850°C	25°C	IEC 751
Ni100	-60°C	+250°C	25°C	DIN 43760
Lin.R	0 Ω	5000 Ω	30 Ω	-----

Max. offset.....	50% del max. val. selez.
Resistenza del cavo per filo (max.)....	10 Ω
Corrente del sensore .....	Nom. 0,2 mA
Effetto sulla resistenza cavo sensore (3- / 4-fill) .....	< 0,002 Ω/Ω
Rilevamento errore del sensore.....	Si

### Specifiche elettriche, ingresso mA / V / mV:

#### Ingresso corrente:

Range di misura .....	0...100 mA
Min. range di misura (campo).....	4 mA
Max. offset.....	50% del max. val. selez.
Resistenza d'ingresso:	
Con alimentazione .....	Nom. 10 Ω + PTC 10 Ω
Senza alimentazione .....	RSHUNT = ∞, VDROD < 6 V

#### Ingresso tensione:

Range di misura .....	0...250 VDC
Min. range di misura (campo).....	5 mVDC
Max. offset.....	50% del max. val. selez.
Resistenza d'ingresso ≤ 2,5 VDC .....	Nom. 10 MΩ
> 2,5 VDC .....	Nom. 5 MΩ

#### Specifiche elettriche – uscita:

Range del segnale (campo).....	4...20 mA
Min. range di misura (campo).....	10 mA
Max. offset.....	50% del max. val. selez.
Resistenza di carico .....	≤ ((V <sub>supply</sub> - 7,5)/0,023 A) [Ω]
Stabilità del carico.....	≤ 0,01% d. campo / 100 Ω
Limite corrente .....	≤ 28 mA

#### Rilevamento errore del sensore:

Programmabile .....	3,5...23 mA
NAMUR NE43 Upscale .....	23 mA
NAMUR NE43 Downscale.....	3,5 mA
No function.....	Not defined

#### Ex data:

U <sub>m</sub> .....	≤ 250 V
U <sub>o</sub> .....	= 8,0 VDC
I <sub>o</sub> .....	= 10,0 mADC
P <sub>o</sub> .....	≤ 20 mW
L <sub>o</sub> .....	≤ 200 mH
C <sub>o</sub> .....	≤ 1,0 µF

#### Ex / I.S. approvazioni:

DEMKO 99. ATEX 124572 .....	 II (1) G D
	[EEEx ia] IIC
Applicable in zone .....	Zone 0, 1, 2, 20, 21 o 22

#### Normative osservate:

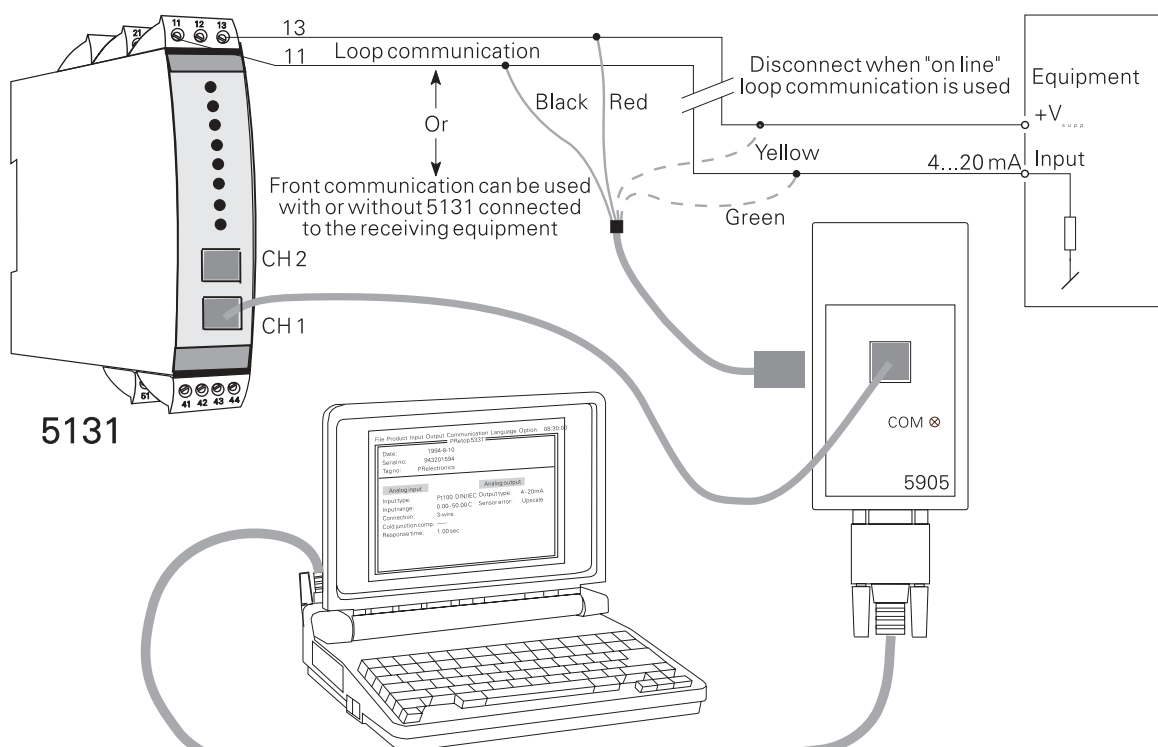
EMC 89/336/EEC, Emissioni .....	EN 50 081-1, EN 50 081-2
Immunità .....	EN 50 082-2, EN 50 082-1
Emissioni ed immunità .....	EN 61 326
LVD 73/23/EEC.....	EN 61 010-1
PELV/SELV.....	IEC 364-4-41
	ed EN 60 742
ATEX 94/9/EC.....	EN 50 014, EN 50 020 ed
	50 281-1-1

**Del campo** = valore del fondo scala selezionato

**Indice delle prestazioni del trasmettitore universale 5131:**  
(Da utilizzare in caso di ordinazione dello strumento già configurato)

INGRESSO TEMPERATURA TC / RTD / Resistenza lineare / mV				INGRESSO CORRENTE / TENSIONE mA / Tensione	
<b>Tipo RTD:</b> Pt100 (DIN/IEC) Ni100  Specify range °C: ____	<b>Tipo termocoppia:</b> Pt30%Rh-Pt6%Rh : tipo B NiCr-CuNi : tipo E Fe-CuNi : tipo J NiCr-Ni : tipo K Fe-CuNi : tipo L NiCrSi-NiSi : tipo N Pt13%Rh-Pt : tipo R Pt10%Rh-Pt : tipo S Cu-CuNi : tipo T Cu-CuNi : tipo U W3%Re/W25%Re : tipo W3 W5%Re/W26%Re : tipo W5 Specify range °C : ____	<b>Range resistenza lineare:</b> (30 Ω ≤ range ≤ 5000 Ω)	<b>Range mV:</b> 5 mV ≤ range ≤ 100 mV  Specify range mV: ____	<b>Range ingresso mA:</b> 4 mA ≤ range ≤ 100 mA  Specify range mA: ____	<b>Range ingresso tensione:</b> 50 mV ≤ range ≤ 250 VDC
<b>RTD connection:</b> 2-wire, no compens. 2-wire, fixed line res. 3-wire compensation 4-wire compensation Specify connection: ____			<b>CJC:</b> Internal CJC (Pt100): External CJC (Pt100): External CJC (Ni100): Fixed external CJC: ____ (Specify °C) ____		
<b>Resistance connection:</b> 2-wire, no compensation: 2-wire, fixed line resistance 3-wire compensation: 4-wire compensation: Specify connection: ____					
<b>Linearizzazione</b> Nessuna linearizzazione: Linearizzazione personalizzata (da specificare):					
<b>USCITA</b> uscita mA: 4...20 mA					
<b>Tempo di risposta:</b> 500/1000 ms ≤ tempo di risposta ≤ 60 s (min. response time depending on input type)					
<b>Sensor error action:</b> <div style="display: flex; justify-content: space-between;"> <div>                         Selected value                          NAMUR NE43 Upscale                          NAMUR NE43 Downscale                     </div> <div>                         Output to max.                          Output to min.                          No sensor error                     </div> </div>					

**Connessione 5131 a Loop Link:**



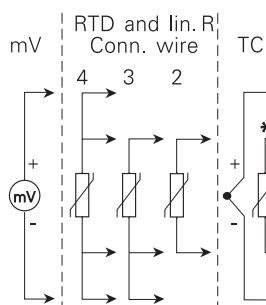
Order: 5131

Tipo	Versione	Ingresso	Canali
5131	Standard : A	RTD / TC / R / mA / V / mV : -	Singolo : A
	ATEX Ex : B	RTD / TC / mV / R : 1	Doppio : B
		mA / V / mV : 2	
		Canale 1, RTD / TC / mV / R	
		Canale 2, mA / V / mV : 3	

**Nota!** Per ingressi da termocoppia ordinare il CJC modello 5910 o 5910 EEx (per il canale 1) e il CJC 5913 o 5913 EEx (per il canale 2)

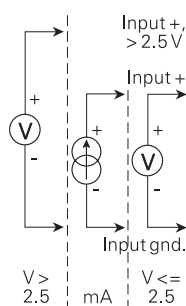
#### Diagramma a blocchi:

Channel 1 shown as a temperature input:

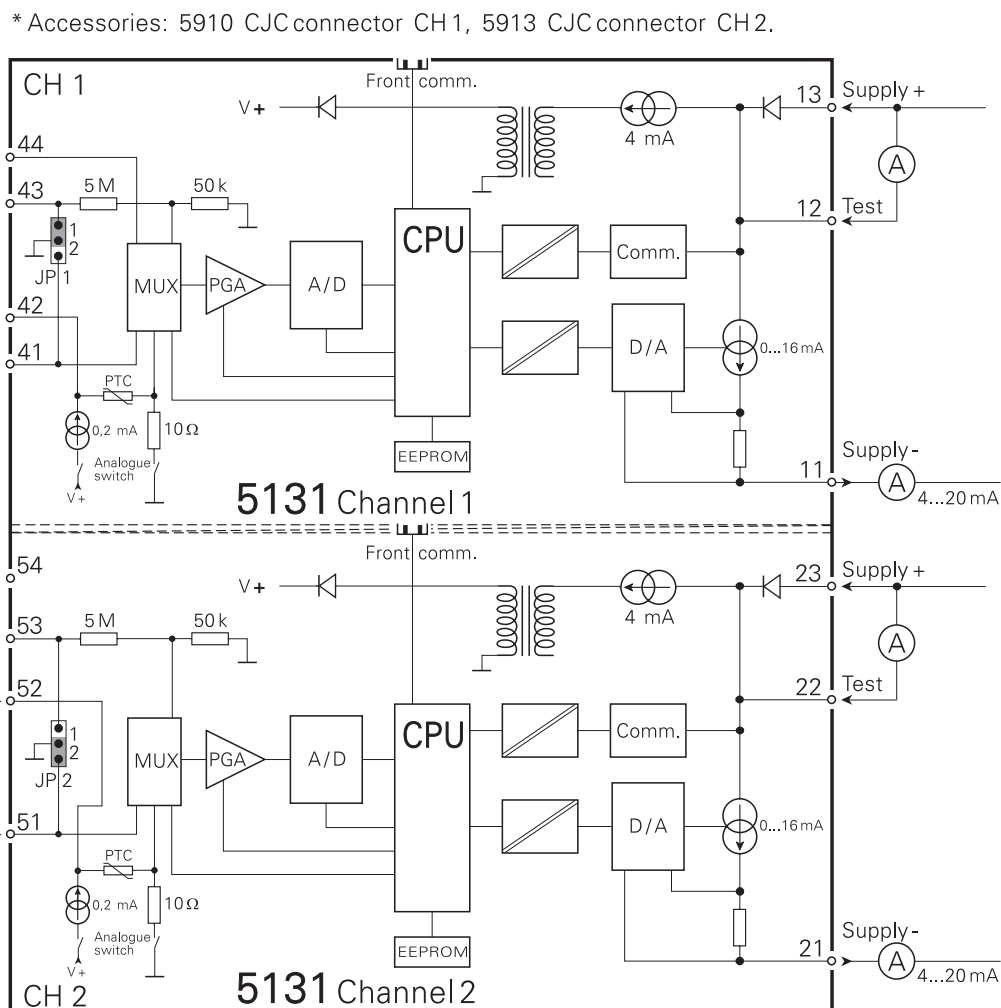


!! If channel 2, use terminal no. 54...51

Channel 2 shown as a current/voltage input:



!! If channel 1, use terminal no. 44...41



#### Selection of input type: (5131A)

Ingresso	JP 1	JP 2
Temperatura canale 1	1	-
Temperatura canale 2	-	1
Corrente / tensione canale 1	2	-
Corrente / tensione canale 2	-	2