



“SMART SERIES” Temperature and signal transmitters and converters for DIN rail mounting

The SMART series devices can accept on their input several types of signals coming from the field; the series is composed of:

- 4÷20 mA two wires isolated Transmitter for universal input (**DAT4035**)
- Isolated Converters for universal input with configurable output as voltage or current (**DAT4135, DAT 4235**)
- Isolated Converter for universal input with configurable output as voltage or current and trip amplifier (**DAT4520**)

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SMART series Temperature and signal transmitters and converters for DIN rail mounting

DAT 4035



GENERAL DESCRIPTION

The transmitter DAT 4035 is able to execute many functions such as: measure and linearisation of the temperature characteristic of RTDs sensors, conversion of a linear resistance variation, conversion of a standard active current signal, conversion of a voltage signal even coming from a potentiometer connected on its input. Moreover the DAT 4035 is able to measure and linearise the standard thermocouples with internal cold junction compensation. The measured values are converted in a 4÷20 mA current signal. The device guarantees high accuracy and performances stability both in time and in temperature.

FEATURES

- Configurable input for RTD, TC, mV, V, mA, Resistance and Potentiometer
- High accuracy
- Configurable by Personal Computer
- 4 ÷ 20 mA configurable output on current loop
- On-field reconfigurable
- Galvanic isolation at 2000 Vac
- Programming of the unit measure as °C or °F
- EMC compliant – CE mark
- Suitable for DIN rail mounting in compliance with EN-50022 and EN-50035



Application areas



POWER SUPPLY		ISOLATION VOLTAGE		TEMPERATURE & HUMIDITY	
Power supply voltage	10 .. 30 Vdc	Input/Power supply	2000 Vac 50 Hz, 1 min.	Operative temperature	-20°C .. +70°C
Reverse polarity protection	60 Vdc max.			Storage temperature	-40°C .. +85°C
				Humidity (not condensed)	0 .. 90 %

EMC (for industrial environments)		HOUSING	
DIRECTIVE 2004/108/EC		Material	Self-extinguishing plastic
Immunity	EN 61000-6-2	Dimensions (mm)	W x L x H : 90 x 112 x 12.5
Emission	EN 61000-6-4	Weight	about 90 g.

INPUT			
Input type	Min	Max	Span min
TC (CJC int./ext.)			
J	-200°C	1200°C	2 mV
K	-200°C	1370°C	2 mV
S	-50°C	1760°C	2 mV
R	-50°C	1760°C	2 mV
B	400°C	1820°C	2 mV
E	-200°C	1000°C	2 mV
T	-200°C	400°C	2 mV
N	-200°C	1300°C	2 mV
RTD 2,3,4 wires			
Pt100	-200°C	850°C	50°C
Pt1000	-200°C	200°C	50°C
Ni100	-60°C	180°C	50°C
Ni1000	-60°C	150°C	50°C
Voltage			
mV	-400 mV	+400 mV	2 mV
mV	-100 mV	+700 mV	2 mV
Volt	- 10 V	+10 V	500 mV
Potentiometer (Nominal value)	0 Ω	200 Ω	10 %
	200 Ω	500 Ω	10 %
	0.5 KΩ	50 KΩ	10 %
Resistance 2,3,4 wires			
Low	0 Ω	300 Ω	10 Ω
High	0 Ω	2000 Ω	200 Ω
Current mA	-10 mA	+24 mA	2 mA
Input impedance			
TC, mV	≥ 10 MΩ		
Volt	≥ 1 MΩ		
Current	~ 50 Ω		

INPUT	
Input calibration (1)	
RTD	the higher of ±0.1% f.s. and ±0.2°C
Res. Low	the higher of ±0.1% f.s. and ±0.15 Ω
Res. High	the higher of ±0.2% f.s. and ±1 Ω
mV, TC	the higher of ±0.1% f.s. and ±18 uV
Volt	the higher of ±0.1% f.s. and ± 2 mV
mA	the higher of ±0.1% f.s. and ± 6 uA
Linearity (1)	
TC	± 0.2 % f.s.
RTD	± 0.1 % f.s.
Line resistance influence (1)	
TC, mV,V	<=0.4 uV/Ohm
RTD 3 wires	0.05 %/Ω (50 Ω balanced max.)
RTD 4 wires	0.005 %/Ω (100 Ω balanced max.)
RTD excitation current	
Typical	0.350 mA
CJC Comp.	± 0.5 °C
Thermal drift (1)	
Full scale	± 0.01 % / °C
CJC	± 0.01 % / °C
Burn-out values	
Max. value output	about 22.5 mA
Min. value output	about 3.6 mA
Response time (10÷90% of f.s.)	about 400 ms

(1) referred to input Span (difference between max. and min. values)

OUTPUT			
Output type	Min	Max	Span min
Direct current	4 mA	20 mA	4 mA
Reverse current	20 mA	4 mA	4 mA
Output calibration			
Current	± 7 uA		

PC PROGRAMMABLE ISOLATED UNIVERSAL SIGNAL CONVERTER

DAT 4135



GENERAL DESCRIPTION

The converter DAT 4135 is able to execute many functions such as: measure and linearisation of the temperature characteristic of RTDs sensors, conversion of a linear resistance variation, conversion of a standard active current signal, conversion of a voltage signal even coming from a potentiometer connected on its input. Moreover the DAT 4135 is able to measure and linearise the standard thermocouples with internal cold junction compensation. In function of programming, the measured values are converted in a current or voltage signal. The device guarantees high accuracy and performances stability both in time and in temperature.

FEATURES

- Configurable input for RTD, TC, mV, V, mA, Resistance and Potentiometer
- High accuracy
- Configurable by Personal Computer
- Configurable output in current or voltage
- On-field reconfigurable
- Galvanic isolation at 2000 Vac
- Programming of the unit measure as °C or °F
- EMC compliant – CE mark
- Suitable for DIN rail mounting in compliance with EN-50022 and EN-50035



Application areas



POWER SUPPLY		ISOLATION VOLTAGE		TEMPERATURE & HUMIDITY	
Power supply voltage	18 .. 30 Vdc	Input/Power supply-Output	2000 Vac 50 Hz, 1 min.	Operative temperature	-20°C .. +70°C
Reverse polarity protection	60 Vdc max.	OUTPUT LOAD RESISTANCE (RLOAD)		Storage temperature	-40°C .. +85°C
		Current output	</= 650 Ω	Humidity (not condensed)	0 .. 90 %
		Voltage output	>/= 3.5 KΩ		
Limitation current	about 25 mA				
CURRENT CONSUMPTION		EMC (for industrial environments)		HOUSING	
Current output	40 mA max.	DIRECTIVE 2004/108/EC		Material	Self-extinguishing plastic
Voltage output	20 mA max.	Immunity	EN 61000-6-2	Dimensions (mm)	W x L x H : 90 x 112 x 12.5
		Emission	EN 61000-6-4	Weight	about 90 g.

INPUT			
Input type	Min	Max	Span min
TC (CJC int./ext.)			
J	-200°C	1200°C	2 mV
K	-200°C	1370°C	2 mV
S	-50°C	1760°C	2 mV
R	-50°C	1760°C	2 mV
B	400°C	1820°C	2 mV
E	-200°C	1000°C	2 mV
T	-200°C	400°C	2 mV
N	-200°C	1300°C	2 mV
RTD 2,3,4 wires			
Pt100	-200°C	850°C	50°C
Pt1000	-200°C	200°C	50°C
Ni100	-60°C	180°C	50°C
Ni1000	-60°C	150°C	50°C
Voltage			
mV	-400 mV	+400 mV	2 mV
mV	-100 mV	+700 mV	2 mV
Volt	- 10 V	+10 V	500 mV
Potentiometer (Nominal value)	0 Ω	200 Ω	10 %
	200 Ω	500 Ω	10 %
	0.5 KΩ	50 KΩ	10 %
Resistance 2,3,4 wires			
Low	0 Ω	300 Ω	10 Ω
High	0 Ω	2000 Ω	200 Ω
Current mA	-10 mA	+24 mA	2 mA
Input calibration (1)			
RTD	the higher of ±0.1 % f.s. and ±0.2°C		
Res. Low	the higher of ±0.1 % f.s. and ±0.15 Ω		
Res. High	the higher of ±0.2 % f.s. and ±1 Ω		
mV, TC	the higher of ±0.1 % f.s. and ±18 uV		
Volt	the higher of ±0.1 % f.s. and ± 2 mV		
mA	the higher of ±0.1 % f.s. and ± 6 uA		

INPUT	
Input impedance	
TC, mV	>= 10 MΩ
Volt	>= 1 MΩ
Current	~ 50 Ω
Linearity (1)	
TC	± 0.2 % f.s.
RTD	± 0.1 % f.s.
Line resistance influence (1)	
TC, mV,V	<=0.8 uV/Ohm
RTD 3 wires	0.05 %/Ω (50 Ω balanced max.)
RTD 4 wires	0.005 %/Ω (100 Ω balanced max.)
RTD excitation current	
Typical	0.350 mA
CJC Comp.	± 0.5°C
Thermal drift (1)	
Full scale	± 0.01 % / °C
CJC	± 0.01 % / °C
Burn-out values	
Max. value output	about 23 mA or 10.8 Vdc
Min. value output	about 0 mA or 0 Vdc
Response time (10÷90% of f.s.)	about 400 ms

(1) referred to input Span (difference between max. and min. values)

OUTPUT			
Output type	Min	Max	Span min
Direct current	0 mA	20 mA	4 mA
Reverse current	20 mA	0 mA	4 mA
Direct voltage	0 V	10 V	1 V
Reverse voltage	10 V	0 V	1 V
Output calibration			
Current	± 7 uA		
Voltage	± 5 mV		

DAT 4135/SEL

GENERAL DESCRIPTION

The converter DAT 4135/SEL is able to execute many functions such as: measure and linearisation of the temperature characteristic of RTDs sensors, conversion of a linear resistance variation, conversion of a standard active current signal, conversion of a voltage signal even coming from a potentiometer connected on its input. Moreover the DAT 4135/SEL is able to measure and linearise the standard thermocouples with internal cold junction compensation. In function of programming, the measured values are converted in a current or voltage signal. The device guarantees high accuracy and performances stability both in time and in temperature.

FEATURES

- Configurable input for RTD, TC, mV, V, mA, Resistance and Potentiometer
- High accuracy
- Configurable by Personal Computer
- Configurable output in current or voltage
- On-field reconfigurable
- Galvanic isolation at 2000 Vac
- Programming of the unit measure as °C or °F
- EMC compliant – CE mark
- Suitable for DIN rail mounting in compliance with EN-50022 and EN-50035


Application areas


POWER SUPPLY		ISOLATION VOLTAGE		SEL INPUT COMMAND	
Power supply voltage	18 .. 30 Vdc	Input/Power supply-Output	2000 Vac 50 Hz, 1 min.	Disable output	4÷30 Vdc
Reverse polarity protection	60 Vdc max.	OUTPUT LOAD RESISTANCE (RLOAD)		Enable output	0 Vdc or not connected
		Current output	<= 650 Ω	TEMPERATURE & HUMIDITY	
		Voltage output	>/= 3.5 KΩ	Operative temperature	-20°C .. +70°C
		Limitation current	20 mA max.	Storage temperature	-40°C .. +85°C
CURRENT CONSUMPTION		EMC (for industrial environments)		Humidity (not condensed)	0 .. 90 %
Current output	40 mA max.	DIRECTIVE 2004/108/EC		HOUSING	
Voltage output	20 mA max.	Immunity	EN 61000-6-2	Material	Self-extinguishing plastic
		Emission	EN 61000-6-4	Dimensions (mm)	W x L x H : 90 x 112 x 12.5
				Weight	about 90 g.

INPUT			
Input type	Min	Max	Span min
TC (CJC int./ext.)			
J	-200°C	1200°C	2 mV
K	-200°C	1370°C	2 mV
S	-50°C	1760°C	2 mV
R	-50°C	1760°C	2 mV
B	400°C	1820°C	2 mV
E	-200°C	1000°C	2 mV
T	-200°C	400°C	2 mV
N	-200°C	1300°C	2 mV
RTD 2,3,4 wires			
Pt100	-200°C	850°C	50°C
Pt1000	-200°C	200°C	50°C
Ni100	-60°C	180°C	50°C
Ni1000	-60°C	150°C	50°C
Voltage			
mV	-400 mV	+400 mV	2 mV
mV	-100 mV	+700 mV	2 mV
Volt	- 10 V	+10 V	500 mV
Potentiometer (Nominal value)	0 Ω	200 Ω	10%
	200 Ω	500 Ω	10%
	0.5 KΩ	50 KΩ	10%
Resistance 2,3,4 wires			
Low	0 Ω	300 Ω	10 Ω
High	0 Ω	2000 Ω	200 Ω
Current mA	-10 mA	+24 mA	2 mA
Input calibration (1)			
RTD	the higher of ±0.1% f.s. and ±0.2°C		
Res. Low	the higher of ±0.1% f.s. and ±0.15 Ω		
Res. High	the higher of ±0.2% f.s. and ±1 Ω		
mV, TC	the higher of ±0.1% f.s. and ±18 uV		
Volt	the higher of ±0.1% f.s. and ± 2 mV		
mA	the higher of ±0.1% f.s. and ± 6 uA		

INPUT	
Input impedance	
TC, mV	>= 10 MΩ
Volt	>= 1 MΩ
Current	~ 50 Ω
Linearity (1)	
TC	± 0.2 % f.s.
RTD	± 0.1 % f.s.
Line resistance influence (1)	
TC, mV,V	<=0.8 uV/Ohm
RTD 3 wires	0.05%/Ω (50 Ω balanced max.)
RTD 4 wires	0.005%/Ω (100 Ω balanced max.)
RTD excitation current	
Typical	0.350 mA
CJC Comp.	± 0.5°C
Thermal drift (1)	
Full scale	± 0.01% / °C
CJC	± 0.01% / °C
Burn-out values	
Max. value output	about 23 mA or 10.8 Vdc
Min. value output	about 0 mA or 0 Vdc
Response time (10÷90% of f.s.)	about 400 ms

(1) referred to input Span (difference between max. and min. values)

OUTPUT			
Output type	Min	Max	Span min
Direct current	0 mA	20 mA	4 mA
Reverse current	20 mA	0 mA	4 mA
Direct voltage	0 V	10 V	1 V
Reverse voltage	10 V	0 V	1 V
Output calibration			
Current	± 7 uA		
Voltage	± 5 mV		

PC PROGRAMMABLE 3 WAYS ISOLATED UNIVERSAL SIGNAL CONVERTER

DAT 4235



GENERAL DESCRIPTION

The converter DAT 4235 is able to execute many functions such as: measure and linearisation of the temperature characteristic of RTDs sensors, conversion of a linear resistance variation, conversion of a standard active current signal, conversion of a voltage signal even coming from a potentiometer connected on its input. Moreover the DAT 4235 is able to measure and linearise the standard thermocouples with internal cold junction compensation. In function of programming, the measured values are converted in a current or voltage signal. The device guarantees high accuracy and performances stability both in time and in temperature.

FEATURES

- Configurable input for RTD, TC, mV, V, mA, Resistance and Potentiometer
- High accuracy
- Configurable by Personal Computer
- Configurable output in current or voltage
- On-field reconfigurable
- Galvanic isolation at 2000 Vac on the 3 ways
- Programming of the unit measure as °C or °F
- EMC compliant – CE mark
- Suitable for DIN rail mounting in compliance with EN-50022 and EN-50035



Application areas



POWER SUPPLY		ISOLATION VOLTAGE		TEMPERATURE & HUMIDITY	
Power supply voltage	18 .. 30 Vdc	Input/Power supply-Output	2000 Vac 50 Hz, 1 min.	Operative temperature	-20°C .. +70°C
Reverse polarity protection	60 Vdc max.	OUTPUT LOAD RESISTANCE (RLOAD)		Storage temperature	-40°C .. +85°C
		Current output	<= 650 Ω	Humidity (not condensed)	0 .. 90 %
		Voltage output	>= 600 Ω		
		Limitation current	30 mA max.		
CURRENT CONSUMPTION		EMC (for industrial environments)		HOUSING	
Current output	70 mA max.	DIRECTIVE 2004/108/EC		Material	Self-extinguishing plastic
Voltage output	50 mA max.	Immunity	EN 61000-6-2	Dimensions (mm)	W x L x H : 90 x 112 x 12.5
		Emission	EN 61000-6-4	Weight	about 90 g.

INPUT			
Input type	Min	Max	Span min
TC (CJC int./ext.)			
J	-200°C	1200°C	2 mV
K	-200°C	1370°C	2 mV
S	-50°C	1760°C	2 mV
R	-50°C	1760°C	2 mV
B	400°C	1820°C	2 mV
E	-200°C	1000°C	2 mV
T	-200°C	400°C	2 mV
N	-200°C	1300°C	2 mV
RTD 2,3,4 wires			
Pt100	-200°C	850°C	50°C
Pt1000	-200°C	200°C	50°C
Ni100	-60°C	180°C	50°C
Ni1000	-60°C	150°C	50°C
Voltage			
mV	-400 mV	+400 mV	2 mV
mV	-100 mV	+700 mV	2 mV
Volt	- 10 V	+10 V	500 mV
Potentiometer (Nominal value)	0 Ω	200 Ω	10%
	200 Ω	500 Ω	10%
	0.5 KΩ	50 KΩ	10%
Resistance 2,3,4 wires			
Low	0 Ω	300 Ω	10 Ω
High	0 Ω	2000 Ω	200 Ω
Current mA	-10 mA	+24 mA	2 mA
Input calibration (1)			
RTD	the higher of ±0.1 % f.s. and ±0.2°C		
Res. Low	the higher of ±0.1 % f.s. and ±0.15 Ω		
Res. High	the higher of ±0.2 % f.s. and ±1 Ω		
mV, TC	the higher of ±0.1 % f.s. and ±18 uV		
Volt	the higher of ±0.1 % f.s. and ± 2 mV		
mA	the higher of ±0.1 % f.s. and ± 6 uA		

INPUT	
Input impedance	
TC, mV	>= 10 MΩ
Volt	>= 1 MΩ
Current	~ 50 Ω
Linearity (1)	
TC	± 0.2 % f.s.
RTD	± 0.1 % f.s.
Line resistance influence (1)	
TC, mV,V	<=0.8 uV/Ohm
RTD 3 wires	0.05 %/Ω (50 Ω balanced max.)
RTD 4 wires	0.005 %/Ω (100 Ω balanced max.)
RTD excitation current	
Typical	0.350 mA
CJC Comp.	± 0.5°C
Thermal drift (1)	
Full scale	± 0.01 % / °C
CJC	± 0.01 % / °C
Burn-out values	
Max. value output	about 25 mA or 10.8 Vdc
Min. value output	about -25 mA or -10.8 Vdc
Response time (10÷90% of f.s.)	about 400 ms

(1) referred to input Span (difference between max. and min. values)

OUTPUT			
Output type	Min	Max	Span min
Direct current	-20 mA	20 mA	4 mA
Reverse current	20 mA	-20 mA	4 mA
Direct voltage	-10 V	10 V	1 V
Reverse voltage	10 V	-10 V	1 V
Output calibration			
Current	± 7 uA or ± 15 uA (2)		
Voltage	± 10 mV		

(2) referred to the output ± 20 mA.

DAT 4520



GENERAL DESCRIPTION

The DAT 4520 device measures mV, V, mA or resistance signals, and can be directly connected to Thermocouple, RTD or potentiometer sensors.

The input signal is filtered, linearised, amplified and transferred to the output circuit, that converts it in a 0-10V range or 0-20mA range signal. Auxiliary power supply allows to supply the output current loop. Moreover, the device is able to control two trip alarm relay outputs. DAT 4520 has a 3 way isolation: input is 2000 Vac isolated from power supply and output; power supply and output are 1500 Vac isolated between them.

FEATURES

- Configurable input for Tc, RTD, Res, mV, V, mA, Potentiometer
- High accuracy
- Configurable by Personal Computer
- 0 to 10V, 0 to 20mA configurable output
- On-field reconfigurable
- 2000 Vac galvanic isolation between input, output
- Programming of the unit measure as °C or °F
- EMC compliance – CE mark
- Suitable for DIN rail mounting in compliance with EN-50022 and EN-50035



Application areas



TRIP ALARMS		Isolation voltage		TEMPERATURE & HUMIDITY	
Output type	n° 2 Relay SPDT	Input/Output	2000 Vac, 50 Hz, 1min.	Operative temperature	-20°C .. +60°C
Contact rating	2A, 250 Vac 2A, 30 Vdc	Input/Supply	2000 Vac, 50 Hz, 1min.	Storage temperature	-40°C .. +85°C
Load	resistive	Supply/Output	1500 Vac, 50 Hz, 1min.	Humidity (not condensed)	0 .. 90 %
Minimum load	5Vdc, 10mA	EMC (for industrial environments)		HOUSING	
Voltage max	250 Vac (50/60 Hz) 110 Vdc	DIRECTIVE 2004/108/EC		Material	Self-extinguishing plastic
Isolation voltage	coil-to-contacts: 2000Vac between contacts: 1000Vac	Immunity	EN 61000-6-2	Mounting	DIN Rail
POWER SUPPLY		Emission	EN 61000-6-4	Dimensions (mm)	W x L x H : 120 x 100 x 22.5
Power supply voltage	20 .. 30 Vdc			Weight	about 150 g.
Reverse polarity protection	60 Vdc max.				

INPUT			
Input type	Min	Max	Span min
TC (CJC int./ext.)			
J	-200°C	1200°C	2 mV
K	-200°C	1370°C	2 mV
S	-50°C	1760°C	2 mV
R	-50°C	1760°C	2 mV
B	400°C	1820°C	2 mV
E	-200°C	1000°C	2 mV
T	-200°C	400°C	2 mV
N	-200°C	1300°C	2 mV
RTD 2,3,4 wires			
Pt100	-200°C	850°C	50°C
Pt1000	-200°C	200°C	50°C
Ni100	-60°C	180°C	50°C
Ni1000	-60°C	150°C	50°C
Voltage			
mV	-100 mV	+700 mV	2 mV
Volt	0 mV	10 V	500 mV
Potentiometer (Nominal value)	0 Ω	200 Ω	10%
	200 Ω	500 Ω	10%
	0.5 KΩ	50 KΩ	10%
Resistance 2,3,4 wires			
Low	0 Ω	300 Ω	10 Ω
High	0 Ω	2000 Ω	200 Ω
Current mA	0 mA	20 mA	2 mA

Input calibration (1)	
RTD	the higher of ±0.1 % f.s. and ±0.2°C
Res. Low	the higher of ±0.1 % f.s. and ±0.15 Ω
Res. High	the higher of ±0.2 % f.s. and ±1 Ω
mV, TC	the higher of ±0.1 % f.s. and ±10 uV
Volt	the higher of ±0.1 % f.s. and ± 2 mV
mA	the higher of ±0.1 % f.s. and ± 6 uA

INPUT	
Input impedance	
TC, mV	>= 10 MΩ
Volt	>= 1 MΩ
Current	~ 50 Ω
Linearity (1)	
TC	± 0.2 % f.s.
RTD	± 0.1 % f.s.
Line resistance influence (1)	
TC, mV,V	<=0.8 uV/Ohm
RTD 3 wires	0.05 %/Ω (50 Ω balanced max.)
RTD 4 wires	0.005 %/Ω (100 Ω balanced max.)
RTD excitation current	
Typical	0.350 mA
CJC Comp.	± 0.5°C
Thermal drift (1)	
Full scale	± 0.01 % / °C
CJC	± 0.01 % / °C
Response time (10÷90% of f.s.)	about 400 ms

(1) referred to input Span (difference between max. and min. values)

OUTPUT			
Output type	Min	Max	Span min
Direct voltage	0 V	10 V	1 V
Direct current	0 mA	20 mA	4 mA
Output calibration			
Current	± 7 uA		
Voltage	± 10 mV		
Output Load Resistance			
Current	< 650 Ω		
Voltage	> 4.7 KΩ		



“SMART SERIES” Temperature and signal transmitters and converters for Din rail mounting

<p><i>Industries</i></p>	<p><i>Board machine</i></p>	<p><i>Energy</i></p>	<p><i>Food business</i></p>	<p><i>Water treatment</i></p>	<p>Application areas</p>
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