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Programmable digital indicator

Case for flush-panel mounting to DIN 43 700

Bezel size 96mm x 48mm



Brief description

The 701520 indicator is an instrument which is universally applicable, thanks to the programmable input and display.

The configurable analogue input permits the direct connection of resistance thermometers, thermocouples, potentiometers, resistance transmitters or transducers with voltage outputs from -10V to +10V and current outputs from -100 to +100mA. The internal 24V supply supports external 2-wire transmitters.

The instrument is configured from a PC through the setup program.

The measured value is indicated on a 14mm high, 4-digit LED display.

The sampling rate is three measurements per second.

The operating voltage is provided by a primary-switched switchmode power supply, operating off a mains voltage of either 20 – 53V DC/AC, 0/48 – 63Hz or 110 – 240V AC, 48 – 63Hz. Faston tab connectors, size 6.3mm x 0.8 mm or 2x 2.8mm x 0.8mm, are used to make connections to DIN 46 244/A.



Type 701520/...

Type designation

Basic type 1. 2.
 701520 / -

(1) Input

	Code
Universal measurement input, programmable	888
Customized	999

(2) Supply voltage

	Code
110 – 240V +10/-15% AC, 48 – 63Hz	23
20 – 53V ±0% DC/AC, 0/48 – 63Hz	22

Ordering example

701520/999-23
 Measurement range: 4 – 20mA,
 Display: 2.0 – 12.0pH

Standard accessories

1 Installation Instructions B 70.1520.4
 2 fixing elements

Accessories

Setup program on 3.5" diskette
 PC interface with TTL/RS232 converter

Technical data

Thermocouple input

	Measurement range	Linearisation accuracy (1)
Fe-Con L	-100 + 900°C	± 0.15%
Fe-Con J IEC	- 50 + 120°C	± 0.15%
Cu-Con U	-200 + 600°C	± 0.5%
Cu-Con T IEC	- 50 + 400°C	± 0.5%
NiCr-Ni K IEC	- 50 +1372°C	± 0.2%
NiCr-Con E IEC	- 50 +1000°C	± 0.2%
NiCr-Si-NiSi N IEC	- 50 +1300°C	± 0.2%
Pt10Rh-Pt S IEC	- 50 +1768°C	± 0.25%
Pt13Rh-Pt R IEC	- 50 +1768°C	± 0.2%
Pt30Rh-Pt6Rh B IEC	500 +1820°C	± 0.25%
MoRe5-MoRe41	0 +1700°C	± 0.2%
W3Re-W25Re D	0 +2495°C	± 0.5%
W5Re-W26Re C	0 +2320°C	± 0.5%
Shortest span	Types L, J, U, T, K, E, N: Types S, R, B, MoRe5-MoRe41, D, C:	100°C 500°C
Cold junction	internal Pt 100 or constant external thermostat	
Cold junction accuracy	± 1°C	
Sampling rate	3 measurements per second	
Special features	can also be programmed in °F, measurement range limits are freely programmable	

1. The linearisation accuracy refers to the maximum measurement span.
 The linearisation accuracy is reduced for shorter spans.

Resistance thermometer input

	Measurement range	Linearisation accuracy (1)
Pt100 DIN ISO	-200 +850°C	± 0.2 %
Pt100 DIN JIS	-200 +649°C	± 0.2 %
Pt500	-200 +850°C	± 0.2 %
Pt1000	-200 +850°C	± 0.2 %
Ni100	- 60 +180°C	± 0.2 %
Ni1000	- 60 +150°C	± 0.2 %
Type of connection	2-, 3- or 4-wire circuit	
Shortest measurement span	15°C	
Sensor lead resistance	max. 30Ω per lead	
Sampling rate	3 measurements per second	
Special features	can also be programmed in °F, measurement range limits are freely programmable	

1. The linearisation accuracy refers to the maximum measurement span.
The linearisation accuracy is reduced for shorter spans.

Features

- configuration from PC through setup program
- electrically isolated measurement input (setup is not isolated from the measurement input)
- many different inputs possible:
 - resistance thermometer in 2-/3-/4-wire circuit
 - thermocouple
 - resistance transmitter
 - standard signals
 - potentiometer in 2-/3-/4-wire circuit
- internal cold junction
- customized linearisation
- offset correction
- input filter for interference suppression
- 24 V supply for 2-wire transmitter

DC voltage input, DC current input

Basic measurement span	Measurement range	Accuracy (1)
1V	-1 to +1V	± 0.15 %
10V	-10 to +10V	± 0.15 %
Shortest span	10mV	
10mA	-10 to +10mA	± 0.15 %
20mA	0 – 20mA	± 0.15 %
200mA	-100 to +100mA / 0 – 200mA	± 0.15 %
Shortest span	0.1 mA	
Sampling rate	3 measurements per second	
Special features	linearisation of non-linear transducers for resistance thermometers and thermocouples; measurement range limits are freely programmable	

1. The accuracy refers to the maximum display range (12000 digit)

Potentiometer or resistance transmitter input

Basic measurement span	Measurement range	Accuracy (1)
20 – 4000Ω	20 – 4000Ω	± 0.15 %
Type of connection	2-, 3-, or 4-wire circuit	
Minimum resistance	20Ω	
Maximum resistance	4000Ω	
Sensor lead resistance	max. 30Ω per lead	
Sampling rate	3 measurements per second	
Special features	measurement range limits are freely programmable	

1. The accuracy refers to the maximum display range (12000 digit)

Out-of-range and transducer short-circuit / open-circuit

	Resistance thermometer/ resistance transmitter	Thermocouple/ potentiometer	Voltage	Current
Out-of-range (below range) (1)	recognised	recognised	recognised	recognised
Out-of-range (above range) (1)	recognised	recognised	recognised	recognised
Transducer short-circuit (1)	recognised	not recognised	not recognised	0 – 20mA not recognised; 4 – 20mA recognised
Transducer open-circuit (1)	recognised (2)	recognised	recognised up to ±1V	0 – 20mA not recognised; 4 – 20mA recognised

1. Indicated by flashing LED

2. Lead break in a 4-wire circuit is only recognised on terminals 13 and 14

Display

Type	LED; 7-segment; 4 digit		
Height	14mm		
Display range	-1999 to +9999 digit		
Transfer characteristic (configurable)	resistance thermometer, thermocouple	linear with temperature, linearised to customer specification	
	voltage, current	linear, linearised for resistance thermometer, linearised for thermocouple, linearised to customer specification	
	resistance transmitter	linear, linearised to customer specification	
	potentiometer	linear, linearised to customer specification	
Decimal places (configurable)	thermocouple	none or one	
	resistance thermometer	none, one or two	
	voltage, current, resistance transmitter, potentiometer	none, one, two or three	
2nd order digital filter	0 – 100s configurable		
Customized linearisation	max. 61 calibration points, linear, quadratic, or cubic interpolation		

Supply voltage

Supply voltage	110 – 240V +10/-15% AC, 48 – 63Hz or 20 – 53V DC/AC, 0/48 – 63Hz, (1) 5.5VA power consumption
Electrical safety	to EN 61 010; pollution degree 2; overvoltage category II

1. DC/AC also known as UC

Environmental influences

Operating temp. range	0 to 50°C	
Storage temp. range	-20 to +70°C	
Temperature error	resistance thermometer	0.02% / 10°C (1)
	thermocouple	0.05% / 10°C (1) in addition to the cold junction error
	voltage, current, resistance transmitter, potentiometer	0.001% / 10°C (2)
Climatic conditions	rel. humidity ≤ 75%, no condensation; pollution degree 2	
EMC - Interference emission - Immunity to interference	EN 61 326 Class B industrial requirements	
IP protection	front	IP54
	back	IP20

1. Refers to the maximum measurement span.

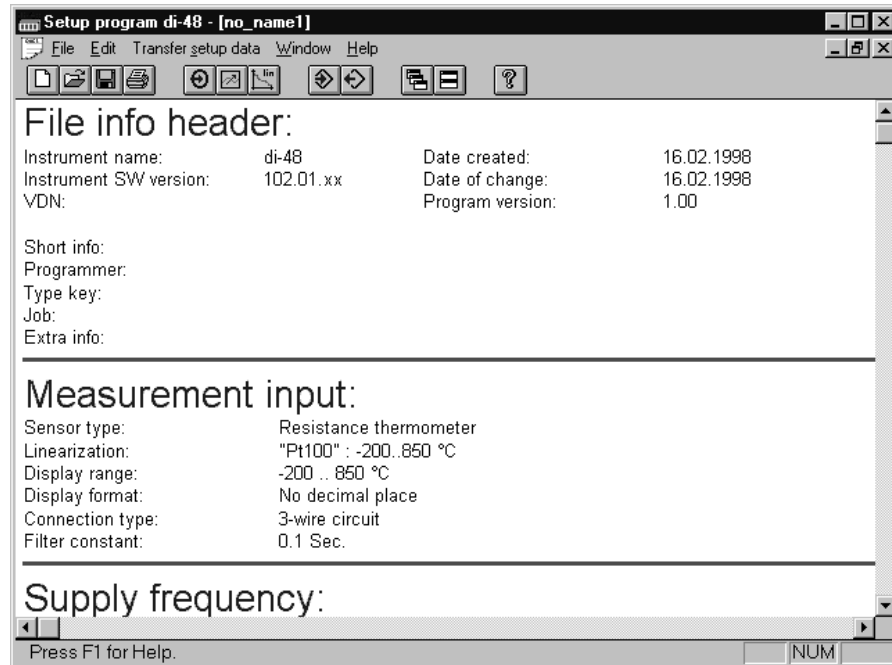
2. The accuracy refers to the maximum display range (12000 digit).

Case

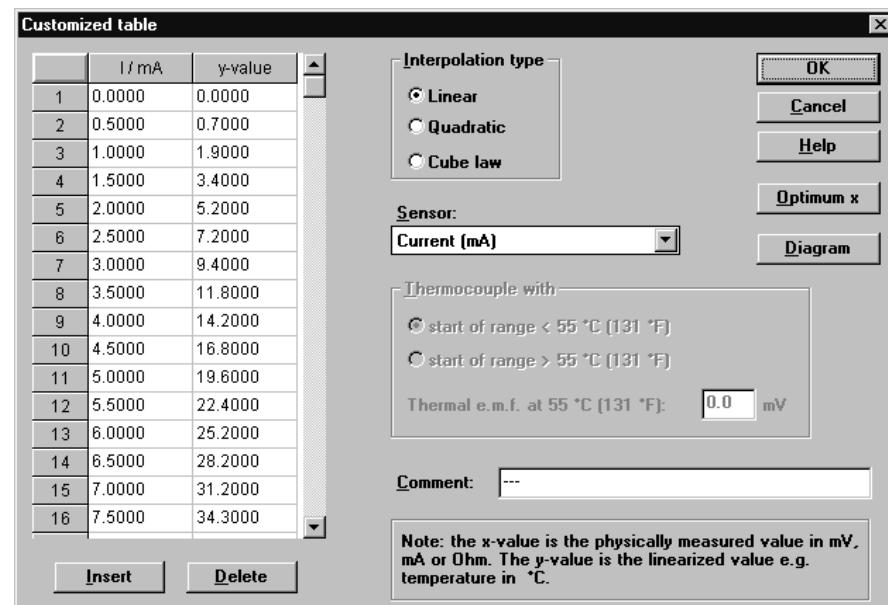
Material	Polycarbonate
Front bezel size	96mm x 48mm
Mounting depth	107mm
Mounting position	any
Electrical connection (to DIN 46 244/A)	faston tabs 6.3mm x 0.8mm, faston tabs 2.8mm x 0.8mm
Weight	250g

Setup program

The program is used to carry out the configuration of the instrument and to transfer the setup data to and from the instrument. The setup data can be output to a printer in the form of a list and saved to or loaded from any available data storage media. The connection between the PC and the instrument, via the PC interface cable, is only required for the transfer of setup data. It is not necessary to make a connection to the instrument while processing the data (loading from or saving to data media, editing).

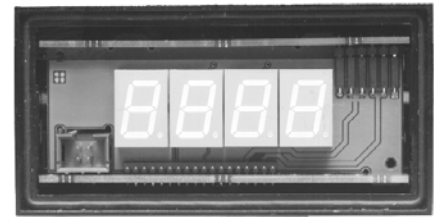


Display of a temperature, measured by a NiCr-Ni thermocouple and a non-linearised 2-wire transmitter, 4 – 20 mA, 0 – 900 °C linear with thermocouple voltage NiCr-Ni.



Customized linearisation for the filling level of a flat tank (using a pressure sensor).

The setup interface in the instrument can be accessed after levering off the front panel.



The program can be operated through the 5 items in the menu bar, or through the symbol bar which is arranged beneath it.

File

To open or save the configuration data, and for printing them out. In addition, selections can be made for the display (menu or symbol bar), for the interface transmission, and for the language used by the operator.

Edit

For the input of the application-specific parameters: measurement input, mains supply frequency, TAG-number (measuring station/instrument number), linearisation table, information text.

Setup data transfer

To transfer the parameters from the PC to the instrument, or to read them out from the instrument.

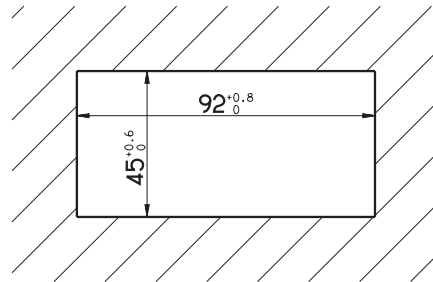
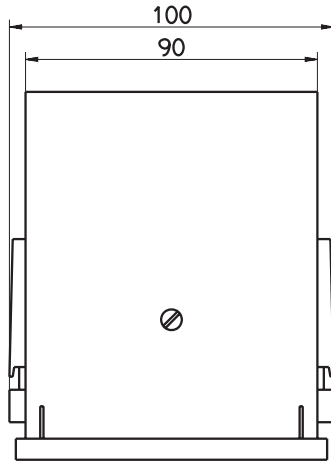
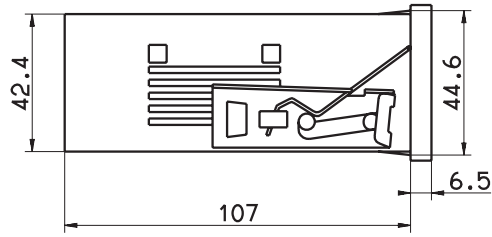
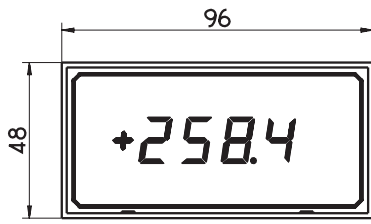
Windows

To arrange the windows when several configuration files are open at the same time. Each one of these files defines an instrument. Individual parameters can be copied from one open file to another.

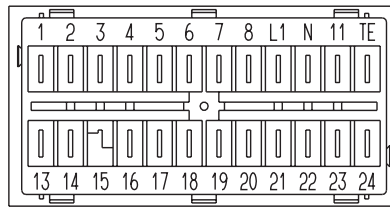
Help

Provides information on operating the program and the parameters which can be set.

Dimensions



Connection diagram



Connection for	Terminals	Symbol
Supply voltage as on label	L1 Line N Neutral TE Technical earth	L+ L- L1(L+) N(L-) TE ↓ ↓ ↓ L1(L+) N(L-) TE
Output		
Voltage supply	1+ 24V/45mA 2- Supply for 2-wire transmitter	1 2 ↓ ↓ + -
Measurement input		
Voltage	14+ ≤ 1V 16-	14 16 ↓ U _x ↓ + -
	17+ ≤ 10V 16-	17 16 ↓ U _x ↓ + -
Current	18+ ≤ 10mA 16-	18 16 ↓ I _x ↓ + -
	15+ ≤ 200mA 16-	15 16 ↓ I _x ↓ + -
Thermocouple	14+ 16-	14 16 ↓ ↓ + -
Resistance thermometer	2-wire circuit: 13 Lead resistance $R_L \leq 30\Omega$ 16 R_L is entered in the setup program	13 16 ↓ ↓ ϑ ††
	3-wire circuit: 13 14 16	13 14 16 ↓ ↓ ↓ ϑ ††
	4-wire circuit: 13 14 15 16	13 14 15 16 ↓ ↓ ↓ ↓ ϑ ††
Resistance sensor	13 A = start 14 S = slider 16 E = end	13 14 16 ↓ ↓ ↓ A S E
Potentiometer	2-wire circuit: 13 Lead resistance $R_L \leq 30\Omega$ 16 R_L is entered in the setup program	13 16 ↓ ↓ ϑ ††
	3-wire circuit: 13 14 16	13 14 16 ↓ ↓ ↓ ϑ ††
	4-wire circuit: 13 14 15 16	13 14 15 16 ↓ ↓ ↓ ↓ ϑ ††