N24 DIGITAL PANEL METERS

LUMEL EVERYTHING COUNTS

Features:

IP65 | Program LPConfig | PD14 Programmer | Linear char.

Inputs:

AC | DC | V | -20...20 mA | -10...10 V | 60 mV

Outputs:

U

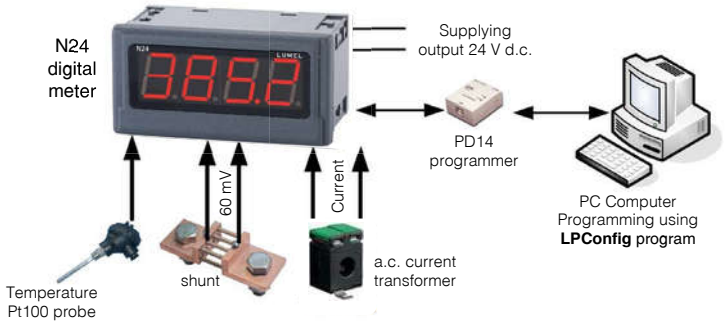
Galvanic isolation:

PD14 Programmer | Sup.



- Destined for measurement of d.c. voltage or d.c. current, temperature through Pt100 resistance thermometers, J, K thermocouples, a.c. voltage and a.c. current.
- 4 LED digit displays with 20 mm digit high.
- Parameters programmable by PD14 programmer:
  - precision of displayed results (decimal point),
  - measurement averaging time,
  - recounting of indications (individual characteristic),
  - automatic or manual compensation: cold junction temperature for measurement with thermocouples or wire resistance for measurement with Pt100 (N24T).

Example of application



Measurement and display:
- temperature
- analog signals
- d.c. current and voltage
- rms current and voltage.

Inputs

Type	Measuring ranges		Parameters	Overloads	Errors
N24S	-11 mV...-10 mV...60 mV...66 mV		Input resistance >1 MΩ	Short duration overload (1s): - voltage input: 10 Un - current input: 5 In Sustained overload: 110% Un, 110% In	**Basic error**: **± (0.2% of range + 1 digit)** **Additional error** from ambient temperature changes: **± (50% of basic error/10K)**
	-66 mV...-60 mV...60 mV...66 mV				
	-0.5 V...0 V...10 V...11 V				
	-11 V...-10 V...10 V...11 V				
	-1 mA...0 mA...20 mA...22 mA		Input resistance 10 Ω ±1%		
	3.6 mA...4 mA...20 mA...22 mA		Input resistance 10 Ω ±1%		
N24T	Pt100	-50°C...150°C	Current flowing through the sensor: < 300 µA. Resistance of wires connecting RTD with the meter: - max 5 Ω (per wire) for automatic compensation - max 10 Ω (per wire) for manual compensation	Short duration overload (1s) Input of sensors: 30 V	**Basic error**: **± (0.2% of range + 1 digit)** **Additional errors:** • compensation of cold junction temperature changes: **± 0.2% of range,** • from ambient temperature changes: **± (50% of basic error/10K).**
		-50°C...400°C			
	Thermo-couple J	-50°C...1200°C			
	Thermo-couple K	-50°C...1370°C			
N24Z	1...100...120 V a.c.		Input resistance > 2 MΩ	Short term overload (1s): voltage input: 2 Un (< 1000V), current input: 10 In Sustained overload: 150% Un (for 400 V input), 120% (for remaining inputs), 120% In	**Basic error**: • voltage and current: **± (0.5% of range + 1 digit)** in frequency range 20...500 Hz • frequency: **± (0.02% of range + 1 digit)** **Additional error** from ambient temperature changes: **± (50% of basic error/10K)**
	2.5...250...300 V a.c.				
	4...400..600 V a.c.				
	20...500 Hz (in voltage range: 24...480 V)				
	0.01...1...1.2 A a.c.		Input resistance 10 mΩ ±10%		
	0.05...5...6 A a.c.		Input resistance 2 mΩ ±10%		
N24H	0...100...110 V d.c.		Input resistance > 2 MΩ	Short term overload (1s): voltage input: 2 Un (< 1000V), current input: 10 In Sustained overload: 150% Un (for ± 400 V input), 120% (for remaining inputs), 120% In	**Basic error**: **± (0.2% of range + 1 digit)** **Additional error** from ambient temperature changes: **± (50% of basic error/10K)**
	0...250...275 V d.c.				
	-120...-100...100...120 V d.c.				
	-300...-250...250...300 V d.c.				
	-600...-400...400...600 V d.c.				
	-1.2...-1...1...1.2 A d.c.		Input resistance 10 mΩ ±10%		
	-6...-5...5...6 A d.c.		Input resistance 2 mΩ ±10%		

Outputs

For N24S and N24T	Output for supply external transducers	24 V ± 5%, 30 mA

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EVERYTHING COUNTS

N24 DIGITAL PANEL METERS

External features

Weight	< 0.25 kg	
Overall dimensions	96 x 48 x 64 mm (with terminals)	panel cut-out: 92 $^{+0.6}$ x 45$^{+0.6}$ mm
Protection grade (acc. to EN 60529)	ensured by the housing: IP65	from the terminal side: IP 20
Display	4-digit LED display, 20 mm high, red colour	indication range: -1999...9999

Rated operating conditions

Supply voltage	230 V ± 10% a.c. (45...65 Hz); 110 V ± 10% a.c. (45...65 Hz) 24 V ± 10% a.c. (45...65 Hz); 85...253 V a.c. (40...400 Hz) or d.c.; 20...40 V a.c. (40...400 Hz) or d.c.	input power consumption: 6 VA
Temperature	ambient: -10...23...55˚C	storage: -25..85 ˚C
Relative humidity	≤ 95%	condensation inadmissible
Operating position	any	
Preheating time	30 min	
Averaging time	≥ 0.5 s	1 second default set

Safety and compatibility requirements

Electromagnetic compatibility	noise immunity	acc. to EN 61000-6-2
	noise emissions	acc. to EN 61000-6-4
Isolation between circuits	basic	acc. to EN 61010-1
Pollution grade	2	
Installation category	III (for the 400 V option - category II)	
Maximal phase-to-earth operating voltage	for supply circuits: 300 V, for measuring circuits: 600 V - cat. II	
	for other circuits: 50 V	
Altitude above sea level	< 2000 m	

Connection diagrams

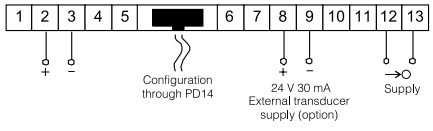

Fig. 1. Electrical connections of the N24S meter

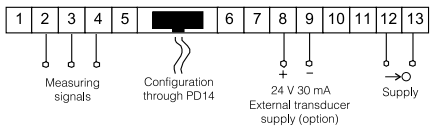

Fig. 2. Electrical connections of the N24T meter.

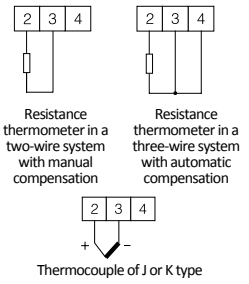

Fig. 3. Connections of N24T measuring inputs

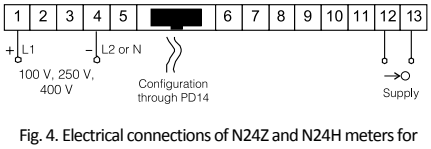

Fig. 4. Electrical connections of N24Z and N24H meters for the measurement of voltage (and frequency only in N24Z)

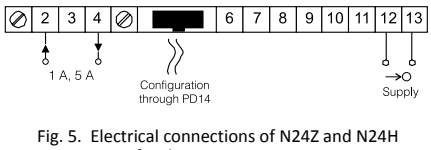

Fig. 5. Electrical connections of N24Z and N24H meters for the current measurement

Ordering

Table 1. Ordering codes:

N24 -	X	X	X	XX	XX	X	X
Input kind:							
standard: voltage, current	S						
temperature: thermocouples, resistance thermometers	T						
a.c. signals	Z						
d.c. signals: high voltage and high current	H						
Input:							
see table 2		X					
Supply:							
230 V a.c.			1				
110 V a.c.			2				
24 V a.c.			3				
85...253 V a.c./d.c. with supply output 24 V/30 mA*			4				
20...40 V a.c./d.c. with supply output 24 V/30 mA*			5				
Unit:							
see table 3				XX			
Version:							
standard					00		
non-standard settings					NS		
custom-made**					XX		
Language:							
Polish						P	
English						E	
other**						X	
Acceptance tests:							
without extra requirements							0
with an extra quality inspection certificate							1
acc. to customer's request**							X

* -The output is only in N24S and N24T meters
** - After agreeing with the manufacturer

Table 2. Input signals

Nr	N24S	N24T	N24Z	N24H
1	0...20 mA	Pt100: -50...150°C	100 V a.c.	±100 V d.c.
2	4...20 mA	Pt100: -50...400°C	250 V a.c.	±250 V d.c.
3	0...60 mV	Thermocouple J	400 V a.c.	±400 V d.c.
4	0...10 V	Thermocouple K	1 A a.c.	±1 A d.c.
5	± 60 mV		5 A a.c.	±5 A d.c.
6	± 10 V		20...500 Hz	0...100 V d.c.
7				0...250 V d.c.

Table 3. Codes of printed units:

Code	Unit	Code	Unit	Code	Unit
00	without unit	06	mA	12	bar
01	˚C	07	kA	13	kPa
02	%	08	kV	14	MPa
03	A	09	Hz	XX	on order
04	V	10	turns		
05	mV	11	rpm		

Table 4. Example of non-standard settings:

Parameter	Range/Value
Decimal point	000,0 for I, U
Averaging time	1 s
Upper measurement overflow	9999
Lower measurement overflow	-1999
Individual characteristic	enabled
Parameter **a** of the individual characteristic	5
Parameter **b** of the individual characteristic	0

Order example 1 :
The code **N24Z-2 1 04 00 E 0** means
N24Z - digital meter for a.c. signals
2 - input: 250 V a.c.
1 - supply: 230 V a.c.
04 - unit: V
00 - standard version
E - English language
0 - without extra requirements

Order example 2 :
The code **N24S-1 4 02 NS E 1** means:
N24S - digital meter for d.c. signals
1 - input: 0...20mA
4 - supply: 85...253 V a.c. wiht supply output: 24V/30mA
02 - unit: %
NS - non-standard settings, display range: 0...100.0
E - English language
1 - with an extra quality inspection certificate

See Also:

LPConfig
Free LPConfig software for easy programming of LUMEL's products. Available on our website



PD14 programmer - unit for programming LUMEL's products, with USB connection, LPCon compatible.



N30 digital panel meters with three-colour display.

For more information about LUMEL's products please visit our website: www.lumel.com.pl

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