



# AZ-02N

## 5-digit Digital Display and Control Unit



## Features

/ Direct voltage and direct current

/ Direct voltage (Shunt)

/ Potentiometer

/ Resistance

/ PT100

/ Thermocouple

/ Frequency

/ AC voltage & alternating current

/ DMS-4-wire

/ Weighing technology

## Description:

The AZ-02N Digital Display offers to the user everything that the current process measuring technology demands from electronic evaluation devices. This device is freely scalable and capable of utilizing a wide spectrum of input signals. Equipped with a 5-digit LED display, it optionally provides an output for sensor power supply and a power or voltage output for further processing of the measurement as well as possible setpoints.

## Application:

This universal display unit is capable of processing signals from all commonly used sensors in fill level, pressure, flow control or temperature measuring technology and displaying them visually. The relay and analogue outputs freely configurable for hysteresis and range optimally evaluate and process the measurement. The AZ-02N is, therefore, also capable of serving as a control unit for simple system operations. Particularly noteworthy is the easy handling and programming of the device, which is carried out on the frontside keys and leaves no questions open. Through the highlighted properties the universal display units are suitable for practically all applications in the industrial or laboratory operation.

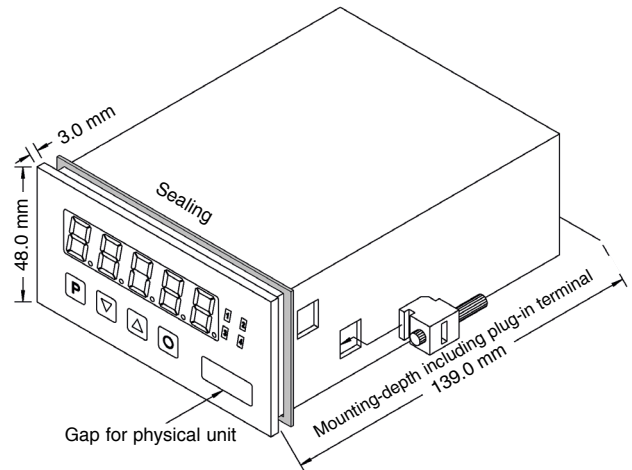


## Technical Specifications:

<b>Housing dim. /</b>	W 96 x H48 x D120 mm incl. plug-in terminal D=139 mm
<b>Panel cut-out /</b>	92.0 <sup>+0,8</sup> x 45.0 <sup>+0,6</sup> mm
<b>Fastening /</b>	screw elements for walls up to 15 mm thick
<b>Housing material /</b>	PC Polycarbonate, black
<b>Sealing material /</b>	EPDM, 65 Shore, black
<b>Protection class /</b>	front side IP65 standard back side IP00
<b>Weight /</b>	approx.. 350 g
<b>Connection /</b>	plug-in terminal; line cross-section up to 2.5 mm <sup>2</sup>
<b>Display /</b>	5-digit
<b>Digit height /</b>	14 mm
<b>Segment colour /</b>	red (standard), optional available in green, blue and orange
<b>Range of display /</b>	-19999 to 99999
<b>Threshold /</b>	optical display flashing
<b>Overflow /</b>	horizontal bars at the top
<b>Underflow /</b>	horizontal bars at the bottom
<b>Display time /</b>	0.1 . .10 seconds
<b>Working temp. /</b>	0°C . .+50°C
<b>Storing temp. /</b>	-20°C . .+80°C
<b>Climatic proof /</b>	relative humidity 0 to 85% on years average without dew
<b>On request /</b>	devices for working temperatures of -20°C to +60°C or -40°C to +70°C

<b>Digital input /</b>	< 2.4 V OFF; 10 V ON; max. 30 VDC, R <sub>i</sub> ~5 kΩ
<b>Interface /</b>	
Protocol:	Modbus with ASCII or RTU
RS232:	9600 Baud, no parity, 8 DataBit, 1 StopBit
Wire length:	max. 3 m
RS485:	9600 Baud, no parity, 8 DataBit, 1 StopBit
Wire length:	max. 1000 m
<b>Memory /</b>	EEPROM Data life ≥ 100 years at 25°C
<b>CE-sign /</b>	Conformity to directive 2004/108/EG
<b>EMC /</b>	EN 61326, EN 5501
<b>Safety standard /</b>	according to low voltage directive 2006/95/EG EN 61010; EN 60664-1

## Dimensions in mm:



## Electrical Specifications:

<b>Supply 1 /</b>	100-240 VAC 50/60 Hz, DC ±10% (max. 15 VA)
<b>Supply 2 /</b>	10-40 VDC galvanically insulated, 18-30 VAC 50/60 Hz (max. 15 VA)
<b>Output /</b>	
Relays:	with change-over contact 250 VAC/ 5 A, 30 VDC/ 5 A
Switching cycles:	30 x 10 <sup>3</sup> at 5 A, ohmic load 10 x 10 <sup>6</sup> mechanically separation as per DIN EN50178 / specifications as per DIN EN 60255
PhotoMos output:	NO-contact: 30 VDC/ AC 0.4 A
Impulse output:	max. 10 kHz (for frequency measurement)
Analog output:	0 . .10 VDC, load ≥ 10 kΩ, 0(4) . .20 mA, load ≤ 500 Ω, 16 Bit)
Sensor supply:	24 VDC/ 50 mA 10 VDC/ 20 mA
Bridge supply:	10 VDC/ 20 . .40 mA/ 250 . .500 Ω

## Measuring inputs:

E1: Direct voltage / direct current		
<b>Span</b>	-12 . .12 V	-22 . .24 mA
<b>Measuring range</b>	0 . .10 VDC	0/4 . .20 mA
<b>Input resistance</b>	R <sub>i</sub> at ~200 kΩ	R <sub>i</sub> at ~100 Ω
<b>Measuring fault</b>	0.1% of measuring range ±1 Digit	0.1% of measuring range ±1 Digit
<b>Temperature drift</b>	100 ppm/K	
<b>Measuring time</b>	0.1 . .10.0 seconds	
<b>Measuring principle</b>	U/F-Converter	
<b>Resolution</b>	approx. 18 Bit at 1s measuring time	



E2: Direct voltage/ Direct current H-Version (High Voltage)				
Span	-600 .. 600 VDC	-300 .. 300 VDC	-50 .. 50 VDC	-1 .. 1 ADC
Measuring range	0 .. 600 VDC	0 .. 300 VDC	0 .. 50 VDC	0 .. 1 ADC
Input resistance	R <sub>i</sub> at ~2 MΩ	R <sub>i</sub> at ~1 MΩ	R <sub>i</sub> at ~200 kΩ	R <sub>i</sub> at ~0,2 Ω
Measuring fault	0.5% of measuring range			
Temperature drift	100 ppm/K			
Measuring time	0.1 .. 10.0 seconds			
Measuring principle	U/F-Converter			
Resolution	approx. 18 Bit at 1s measuring time			

E3: Direct voltage - Shunt				
Span	-5 .. 75 mV	-15 .. 180 mV	-30 .. 360 mV	-100 .. 1200 mV
Measuring range	0 .. 60 mV	0 .. 150 mV	0 .. 300 mV	0 .. 1000 mV
Input resistance	R <sub>i</sub> at ~12 kΩ	R <sub>i</sub> at ~30 kΩ	R <sub>i</sub> at ~60 kΩ	R <sub>i</sub> at ~200 kΩ
Measuring fault	0.5% of measuring range, ±1 Digit	0.5% of measuring range, ±1 Digit	0.5% of measuring range, ±1 Digit	0.5% of measuring range, ±1 Digit
Temperature drift	100 ppm/K			
Measuring time	0.1 .. 10.0 seconds			
Measuring principle	U/F-Converter			
Resolution	approx. 18 Bit at 1s measuring time			

E4: Potentiometer	
Span	> 1 kΩ .. < 1000 kΩ
Measuring range	0 .. 100 %
Measuring fault	0.5% of measuring range, ±1 Digit
Temperature drift	100 ppm/K
Measuring time	0.1 .. 10.0 seconds
Measuring principle	U/F-Converter
Resolution	approx. 18 Bit at 1s measuring time

E5: Resistance			
Span	0 .. 11 kΩ	0 .. 11 kΩ	0 .. 110 kΩ
Measuring range	0 .. 1 kΩ	0 .. 10 kΩ	0 .. 100 kΩ
Measuring fault	0.5% of measuring range, ±1 Digit	0.5% of measuring range, ±1 Digit	0.5% of measuring range, ±1 Digit
Temperature drift	100 ppm/K		
Measuring time	0.1 .. 10.0 seconds		
Measuring principle	U/F-Converter		
Resolution	approx. 18 Bit at 1s measuring time		

E6: PT100 (3-/4-wire) (2-wire via Offset)		
Measuring range	-200.0 .. 850.0 °C	-328.0 .. 1562.0 °F
Measuring fault	0.1% of measuring range, ±1 Digit	0.1% of measuring range, ±1 Digit
Temperature drift	100 ppm/K	
Measuring time	0.1 .. 10.0 seconds	
Measuring principle	U/F-Converter	
Resolution	0.1 °C or 0.1 °F	

E7: Thermal elements	
Measuring range	Type L -200 .. 900°C Type N -270 .. 1300°C Type J -210 .. 1200°C Type E -270 .. 1000°C Type K -270 .. 1372°C Type T -270 .. 400°C Type B 80 .. 1820°C Type R -50 .. 1768°C Type S -50 .. 1768°C
Measuring fault	2 K, ±1 Digit
Temperature drift	100 ppm/K
Measuring time	0.1 .. 10.0 seconds
Measuring principle	U/F-Converter
Resolution	0.1°C
Characteristic curve fault	< ± 1 K
Reference junction	Thermistor

E8: Frequency	
Signal	Pulse input, TTL, Namur, 3-wire initiator PNP/NPN
Input resistance	R <sub>i</sub> at 24 V / 4 kΩ High/Low level > 15 V / < 4 V High/Low TTL-level > 4.6 V / < 1.9 V
Input frequency	0.01 Hz selectable up to 999.99 kHz
Measuring fault	0.05% of measuring range, ±1 Digit



E9: AC voltage, alternating current (true RMS)				
Measuring range	50 VAC	10 VAC	5 AAC	1 AAC
Input resistance	R <sub>i</sub> at ~200 kΩ	R <sub>i</sub> at ~40 kΩ	R <sub>i</sub> at ~0,05 Ω	R <sub>i</sub> at ~0,2 Ω
Measuring fault	at 50 Hz to 1 kHz up to crestfactor 4 for input signals of 1% to 100% of final value			
Temperature drift	100 ppm/K			
Measuring time	0.1 . .10.0 seconds			
Measuring principle	U/F-Converter			
Resolution	approx. 18 Bit at 1s measuring time			

E10: AC voltage, alternating current (true RMS) H-Version (High Voltage)				
Measuring range	600 VAC	300 VAC	5 AAC	1 AAC
Input resistance	R <sub>i</sub> at ~2 MΩ	R <sub>i</sub> at ~1 MΩ	R <sub>i</sub> at ~0,05 Ω	R <sub>i</sub> at ~0,2 Ω
Measuring fault	at 50 Hz to 1 kHz up to crestfactor 4 for input signals of 1% to 100% of final value			
Temperature drift	100 ppm/K			
Measuring time	0.1 . .10.0 seconds			
Measuring principle	U/F-Converter			
Resolution	approx. 18 Bit at 1s measuring time			

E11: DMS-4-wire with calibration	
Sensor sensitivity	1 mV/V, 2 mV/V, 3.3 mV/V, free up to 4 mV/V with 80% calibration

E12: Weighing technology	
Sensor sensitivity	1 mV/V, 2 mV/V, 3.3 mV/V mit Tara

## Possible Configurations:

Selection / Measuring input	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12
Supply voltage 100 . .240 VAC	x	x	x	x	x	x	x	x	x	x	x	x
Supply voltage 10 . .40 VDC	x		x	x	x	x	x	x	x		x	x
Sensor supply 10 VDC, 20 mA	x		x									
Sensor supply 24 VDC, 50 mA	x		x					x				
2x Relay output	x	x	x	x	x	x	x	x	x	x	x	x
4x Relay output	x	x	x	x	x	x	x	x	x	x	x	x
8x PhotoMos-output	x	x	x	x	x	x	x	x	x	x	x	x
1x Analog output 0(4). .20 mA, 0 . .10 VDC	x	x	x	x	x	x	x	x	x	x	x	x
2x Analog output 0(4). .20 mA, 0 . .10 VDC	x	x	x	x	x	x	x	x	x	x	x	x
1x Digital input	x	x	x	x	x			x	x	x	x	x
Interface RS232	x	x	x	x	x	x	x	x	x	x	x	x
Interface RS485	x	x	x	x	x	x	x	x	x	x	x	x



# Ordering Codes:

**Order no.** **AZ-02N.** **2.** **1.** **1.** **E1.** **2.** **1.** **3.** **1**

**AZ-02N Digital Display**

**Size /**

2 = 96 x 48 mm

**Supply Voltage /**

1 = 100-240 VAC  
2 = 10-40 VDC, galvanic insulated

**Sensor supply (incl. digital input) /**

0 = without  
1 = 10 VDC, 20 mA  
2 = 24 VDC, 50 mA  
3 = 24 VDC, 50 mA (incl. impulse output)

**Measuring input /**

E1 = direct voltage / -current (0...10 VDC/ 0(4)...20 mA)  
E2 = direct voltage / -current H-Version  
E3 = direct voltage (Shunt)  
E4 = potentiometer 0 - 100% (> 1 kΩ...< 1000 kΩ)  
E5 = resistance (1 kΩ, 10 kΩ or 100 kΩ)  
E6 = Pt100 (3-/4-wire)  
E7 = thermocouple (type L, J, K, B, S, N, E, T, R)  
E8 = frequency (0.01 Hz...999.99 kHz)  
E9 = AC voltage, alternating current (true RMS)  
E10 = AC voltage, alternating current (true RMS) H-Version  
E11 = DMS-4-wire with calibration  
E12 = weighing technology

**Digital input /**

0 = without  
1 = 1 digital input  
2 = interface RS232 (galvanic insulated)  
3 = interface RS485 (galvanic insulated)  
4 = interface RS232 (incl. digital input)  
5 = interface RS485 (incl. digital input)

**Analog output /**

0 = without  
1 = 1 x 0(4)...20 mA, 0...10 VDC  
2 = 2 x 0(4)...20 mA, 0...10 VDC

**Switching output /**

0 = without  
1 = 2 relay outputs  
2 = 4 relay outputs  
3 = 8 PhotoMos-outputs (analog output 2 is not applicable)

**Options /**

0 = without  
1 = display colour blue (red standard)  
2 = display colour green  
3 = display colour orange  
4 = display colour tricolour (red-green-orange)  
5 = physical unit (selectable)

