

OFFICIAL DOCUMENT PACKAGE

Manufacturer's Manual

Amikon cover with selected official ABB technical pages

ABB AC500 / S500 I/O

AI531

EIGHT-CHANNEL ANALOG INPUT MODULE

Selected official pages retain the original technical tables, ratings, notes and pagination.

OFFICIAL SOURCE

ABB 3ADR010030 rev.14, 2025-11-28; AI531 connections

AI531 ordering and analog input specifications, original pages 1-4

This technical extract does not replace the complete equipment and system manuals. Check the installed hardware and project before use.

AI531

Analog Input Module



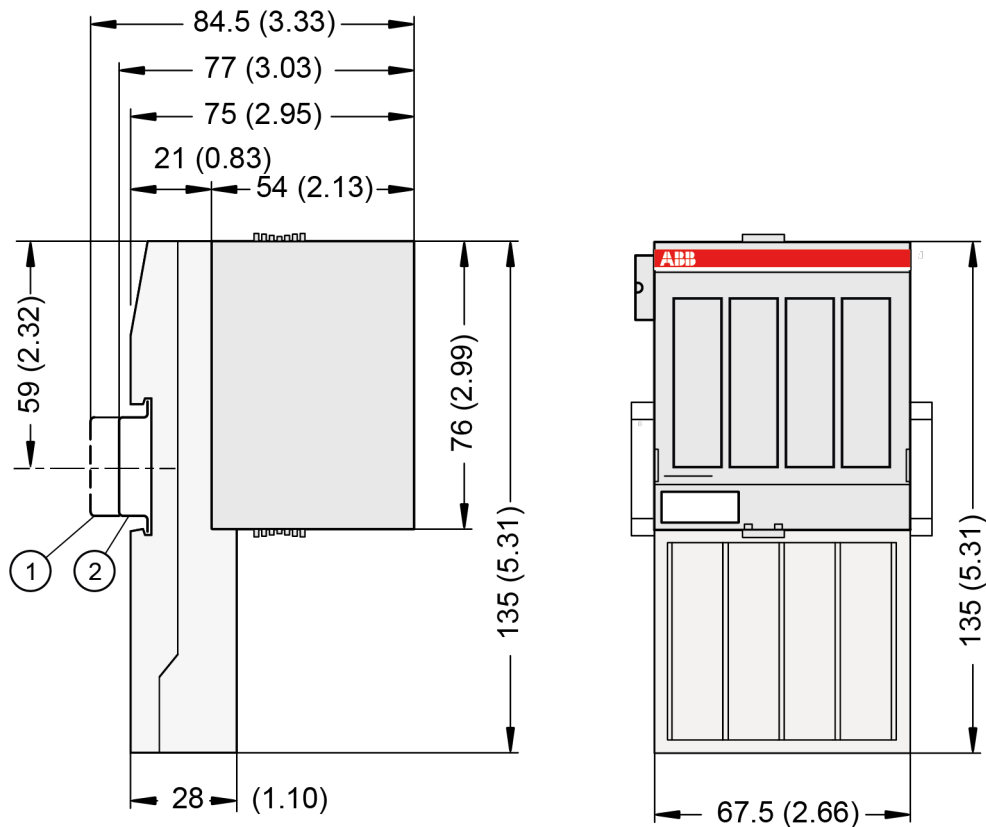
1 Ordering data

Part no.	Description	Product life cycle phase *)
1SAP 250 600 R0001	AI531, analog input module, 8 AI, U/I/Pt100, TC, 16 bits including sign, 4-wires	Active
1SAP 450 600 R0001	AI531-XC, analog input module, 8 AI, U/I/Pt100, TC, 16 bits including sign, 4-wires, XC version	Active



*) Modules in lifecycle Classic are available from stock but not recommended for planning and commissioning of new installations.

2 Dimensions



- 1 Din rail 15 mm
- 2 Din rail 7.5 mm



The dimensions are in mm and in brackets in inch.

3 Technical data

3.1 Technical data of the module

The system data of AC500 and S500 is applicable to the standard version.

🔗 Chapter 4 “System data AC500” on page 5

The system data of AC500-XC is applicable to the XC version.

🔗 Chapter 5 “System data AC500-XC” on page 9

Only deviating specifications are therefore described here.

The technical data is also applicable to the XC version.

Parameter	Value
Process voltage	
Connections	Terminals 1.8, 2.8, 3.8 and 4.8 for +24 V (UP) as well as 1.9, 2.9, 3.9 and 4.9 for 0 V (ZP)
Rated value	24 V DC

Parameter	Value
Max. ripple	5 %
Protection against reversed voltage	Yes
Rated protection fuse on UP	10 A fast
Galvanic isolation	Yes, per module
Current consumption	
From 24 V DC power supply at the terminals UP/L+ and ZP/M of the CPU/communication interface module	Ca. 2 mA
Current consumption from UP in normal operation	130 mA
Inrush current from UP (at power up)	0.056 A ² s
Max. length of analog cables, conductor cross section > 0.14 mm ² *)	100 m
Weight	130 g
Mounting position	Horizontal mounting or Vertical mounting with derating (max. temperature 40 °C)
Cooling	The natural convection cooling must not be hindered by cable ducts or other parts in the control cabinet.
*) Please note that an additional current of approx. 3µA flows out of the input for the wire break detection. Depending on the internal resistance of the signal source and the wire, this can lead to a higher measured value due to the voltage drop.	

**NOTICE!**

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply, short circuit and temporary overvoltage up to 30 V DC.

3.2 Technical data of the analog inputs

Parameter	Value
Number of channels per module	8
Distribution of channels into groups	1 group of 8 channels
Connections of the channels I0 ... I3	Terminals 1.0 ... 1.7 and terminals 2.0 ... 2.7
Connections of the channels I4 ... I7	Terminals 3.0 ... 3.7 and terminals 4.0 ... 4.7
Input type	Bipolar (not with current or Pt100/ Pt1000/ Ni1000/ Cu50/ resistor)
Galvanic isolation	Against internal supply and other modules
Common mode input range	± 20 V DC plus signal voltage

Parameter		Value
Configurability		Digital input, -50 mV ... +50 mV, -500mV ... +500 mV, -1 V ... +1 V, -5 V ... +5 V, -10 V ... +10 V, 0 V ... +5 V, 0 V ... +10 V, -20 mA ... +20 mA, 0 mA ... 20 mA, 4 mA ... 20 mA, Pt100, Pt1000, Ni1000, Cu50, resistor, thermo-couple types J, K, N, S, T (each input can be configured individually)
Channel input resistance		Voltage: > 100 k Ω , current: ca. 330 Ω
Time constant of the input filter		Line-frequency suppression 50 Hz, 60 Hz, none
Indication of the input signals		1 yellow LED per channel, the brightness depends on the value of the analog signal
Conversion time		1 ms (none), 100 ms (50 Hz / 60 Hz) per channel
Resolution		16 bits including sign
Conversion error of the analog values caused by non-linearity, adjustment error at factory and resolution within the normal range	Typ.	± 0.1 % (voltage) ± 0.3 % (current, resistor) at 25 °C
	Max	± 0.7 % (voltage) ± 0.9 % (current, resistor) ± 0.5 % (thermocouple type J, N, S, T; thermocouple type K > -220 °C) 1.0 K (resistance temperature detectors) at 0 °C ... 60 °C or EMC disturbance
Maximum permanent allowed overload (no damage)		
	Current input	When the input current exceeds the overflow value of the measurement range, the input impedance is switched to high impedance for protection. The maximum allowed overload is then 30 V. The digital value corresponds to the overflow value. Periodically, the input impedance is switched to the normal value and the input current is measured. If the input current is within the measurement range, the input impedance remains at the normal level and the digital value corresponds to the measured current.
	Voltage input	30 V
Relationship between input signal and hex code		
Unused voltage inputs		Are configured as "unused"
Unused current inputs		Have a low resistance, can be left open-circuited
Overvoltage protection		Yes