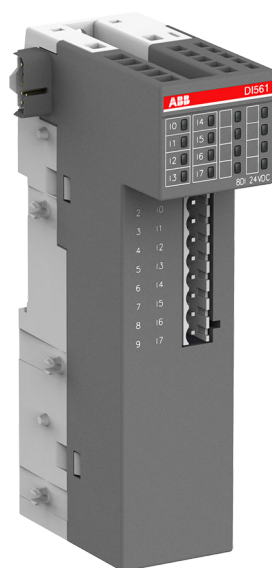


DATA SHEET

DI561

Digital input module



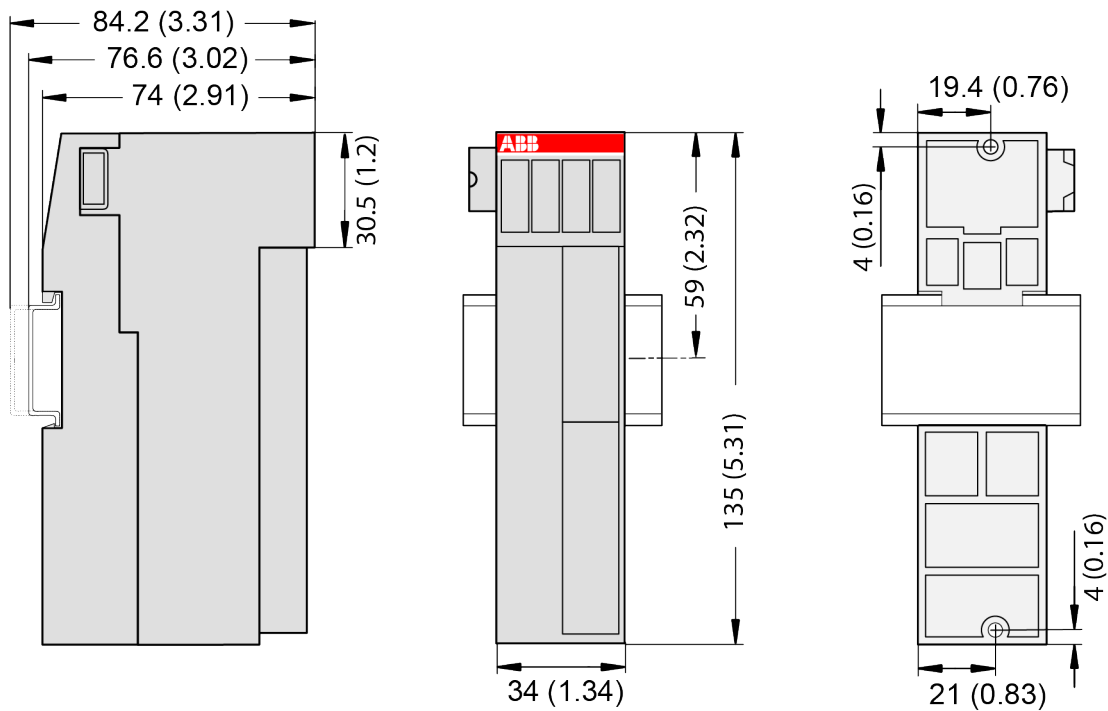
1 Ordering data

Part no.	Description	Product life cycle phase *)
1TNE 968 902 R2101	DI561, digital input module, 8 DI, 24 V DC / 24 V AC	Active
1TNE 968 901 R3101	Terminal block TA563-9, 9 pins, screw front, cable side, 6 pieces per unit	Active
1TNE 968 901 R3103	Terminal block TA564-9, 9 pins, screw front, cable front, 6 pieces per unit	Active
1TNE 968 901 R3105	Terminal block TA565-9, 9 pins, spring front, cable front, 6 pieces per unit	Active



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

2 Dimensions



The dimensions are in mm and in brackets in inch.

3 Technical data

The system data of AC500-eCo apply.
Only additional details are therefore documented below.

3.1 Technical data of the module

Parameter	Value
Galvanic isolation	Yes, between the input group and the rest of the module
Isolated groups	1 (8 channels per group)
Current consumption from 24 V DC power supply at the L+/UP and M/ZP terminals of the CPU/communication interface module	Ca. 10 mA
Max. power dissipation within the module	1.6 W
Weight	Ca. 110 g
Mounting position	Horizontal or vertical
Cooling	The natural convection cooling must not be hindered by cable ducts or other parts in the control cabinet.

3.2 Technical data of the digital inputs

Parameter	Value		
Number of channels per module	8 inputs (24 V DC / 24 V AC)		
Distribution of the channels into groups	1 (8 channels per group)		
Connections of the channels I0 to I7	Terminals 2 ... 9		
Reference potential for the channels I0 to I7	Terminal 1 (plus or negative pole of the process supply voltage, signal name C0 .. 7)		
Indication of the input signals	1 yellow LED per channel; the LED is ON when the input signal is high (signal 1). The module is powered through the I/O bus.		
Monitoring point of input indicator	LED is part of the input circuitry		
Input type according to EN 61131-2	Type 1 source	Type 1 sink	Type 1 AC ¹⁾
Input signal range	-24 V DC	+24 V DC	24 V AC 50/60 Hz
Signal 0	-5 V ... +3 V	-3 V ... +5 V	0 V AC ... 5 V AC
Undefined signal	-15 V ... -5 V	+5 V ... +15 V	5 V AC ... 14 V AC
Signal 1	-30 V ... -15 V	+15 V ... +30 V	14 V AC ... 27 V AC
Input current per channel			
Input voltage 24 V	Typ. 5 mA		Typ. 5 mA r.m.s.
Input voltage 5 V	Typ. 1 mA		Typ. 1 mA r.m.s.
Input voltage 14 V			Typ. 2.7 mA r.m.s.
Input voltage 15 V	> 2.5 mA		
Input voltage 27 V			Typ. 5.5 mA r.m.s.
Input voltage 30 V	< 8 mA		
Max. permissible leakage current (at 2-wire proximity switches)	1 mA		Typ. 1 mA r.m.s.
Input delay (0->1 or 1->0)	Typ. 8 ms		
Input data length	1 byte		
Max. cable length			
Shielded	500 m		
Unshielded	300 m		

¹⁾ When inputs are used with 24 V AC, external surge limiting filters are required.

4 System data AC500-eCo

4.1 Environmental conditions

Table 1: Process and supply voltages

Parameter	Value
24 V DC	
Voltage	24 V (-15 %, +20 %)
Protection against reverse polarity	Yes
24 V AC	
Voltage	24 V (-15 %, +10 %)

Parameter		Value
	Frequency	50/60 Hz (-6 %, +4 %)
100 V AC		
	Voltage	100 V (-15 %, +10 %)
	Frequency	50/60 Hz (-6 %, +4 %)
230 VAC		
	Voltage	230 V (-15 %, +10 %)
	Frequency	50/60 Hz (-6 %, +4 %)
100 V AC ... 240 V AC wide-range supply		
	Voltage	100 V ... 240 V (-15 %, +10 %)
	Frequency	50/60 Hz (-6 %, +4 %)
Allowed interruptions of power supply, according to EN 61131-2		
	DC supply	Interruption < 10 ms, time between 2 interruptions > 1 s, PS2
	AC supply	Interruption < 0.5 periods, time between 2 interruptions > 1 s

**NOTICE!****Risk of damaging the PLC due to improper voltage levels!**

- Never exceed the maximum tolerance values for process and supply voltages.
- Never fall below the minimum tolerance values for process and supply voltages. Observe the **system data** and the **technical data** of the used module.

**NOTICE!**

Improper voltage level or frequency range which cause damage of AC inputs:

- AC voltage above 264 V
- Frequency below 47 Hz or above 62.4 Hz

**NOTICE!**

Improper connection leads cause overtemperature on terminals.

PLC modules may be destroyed by using wrong cable type, wire size and cable temperature classification.

Parameter		Value
Temperature		
	Operating	0 °C ... +60 °C (horizontal mounting of modules) 0 °C ... +40 °C (vertical mounting of modules and output load reduced to 50 % per group)
	Storage	-40 °C ... +70 °C
	Transport	-40 °C ... +70 °C
Humidity		Max. 95 %, without condensation
Air pressure		

Parameter	Value
Operating	> 800 hPa / < 2000 m
Storage	> 660 hPa / < 3500 m

4.2 Creepage distances and clearances

The creepage distances and clearances meet the requirements of the overvoltage category II, pollution degree 2.

4.3 Insulation test voltages, routine test

According to EN 61131-2

Parameter	Value	
200 V ... 240 V circuits against other circuitry	2500 V	1.2/50 μ s
100 V ... 127 V circuits against other circuitry	1500 V	1.2/50 μ s
100 V ... 240 V circuits against other circuitry	2500 V	1.2/50 μ s
24 V circuits (supply, 24 V inputs/outputs, analog inputs/outputs), if they are galvanically isolated against other circuitry	500 V	1.2/50 μ s
COM interfaces, galvanically isolated	500 V	1.2/50 μ s
COM interfaces, electrically not isolated	Not applicable	Not applicable
FBP interface	500 V	1.2/50 μ s
Ethernet	500 V	1.2/50 μ s
ARCNET	500 V	1.2/50 μ s
200 V ... 240 V circuits against other circuitry	1350 V	AC 2 s
100 V circuits against other circuitry	820 V	AC 2 s
100 V ... 240 V circuits against other circuitry	1350 V	AC 2 s
24 V circuits (supply, 24 V inputs/outputs, analog inputs/outputs), if they are galvanically isolated against other circuitry	350 V	AC 2 s
COM interfaces, galvanically isolated	350 V	AC 2 s
COM interfaces, electrically not isolated	Not applicable	Not applicable
FBP interface	350 V	AC 2 s

Parameter	Value	
Ethernet	350 V	AC 2 s
ARCNET	350 V	AC 2 s

4.4 Power supply units

For the supply of the modules, power supply units according to SELV or PELV specifications must be used.



Safety Extra Low Voltage (SELV) and Protective Extra Low Voltage (PELV)

To ensure electrical safety of AC500/AC500-eCo extra low voltage circuits, 24 V DC supply, communication interfaces, I/O circuits, and all connected devices must be powered from sources meeting requirements of SELV, PELV, class 2, limited voltage or limited power according to applicable standards.



WARNING!

Improper installation can lead to death by touching hazardous voltages!

To avoid personal injury, safe separation, double or reinforced insulation and separation of the primary and secondary circuit must be observed and implemented during installation.

- Only use power converters for safety extra-low voltages (SELV) with safe galvanic separation of the primary and secondary circuit.
- Safe separation means that the primary circuit of mains transformers must be separated from the secondary circuit by double or reinforced insulation. The protective extra-low voltage (PELV) offers protection against electric shock.

4.5 Electromagnetic compatibility

Table 2: Range of use

Application
Device suitable only as <i>Control Equipment for Industrial Applications</i> .

Immunity against electrostatic discharge (ESD):		According to IEC 61000-4-2, zone B, criterion B
	Electrostatic voltage in case of air discharge	8 kV
	Electrostatic voltage in case of contact discharge	4 kV, in a closed control cabinet 6 kV ¹⁾
	ESD with communication connectors	In order to prevent operating malfunctions, it is recommended, that the operating personnel discharge themselves prior to touching communication connectors or perform other suitable measures to reduce effects of electrostatic discharges.
Immunity against the influence of radiated (CW radiated):		According to IEC 61000-4-3, zone B, criterion A
	Test field strength	10 V/m

Immunity against electrostatic discharge (ESD):		According to IEC 61000-4-2, zone B, criterion B
Immunity against transient interference voltages (burst):		According to IEC 61000-4-4, zone B, criterion B
	Power supply (DC)	2 kV
	Power supply (AC)	2 kV
	Digital inputs/outputs (24 V DC / 24 VAC)	1 kV
	Digital inputs/outputs (100 V AC ... 240 V AC)	2 kV
	Analog inputs/outputs	1 kV
	Serial RS-485 interfaces (COM)	1 kV
	Ethernet	1 kV
	I/O supply, DC-out	1 kV
Immunity against the influence of line-conducted interferences (CW conducted):		According to IEC 61000-4-6, zone B, criterion A
	Test voltage	10 V
High energy surges		According to IEC 61000-4-5, zone B, criterion B
	Power supply (DC)	2 kV CM / 1 kV DM ²⁾
	Power supply (AC)	1 kV CM / 0.5 kV DM ²⁾
	DC I/O supply, add. DC-supply-out	1 kV CM / 0.5 kV DM ²⁾
	Communication lines, shielded	1 kV CM ²⁾
	AC I/O unshielded ³⁾	2 kV CM / 1 kV DM ²⁾
	Analog inputs/outputs, I/O DC unshielded ³⁾	1 kV CM / 0.5 kV DM ²⁾
Radiation (radio disturbance)		According to IEC 55011, group 1, class A

¹⁾ High requirement for shipping classes are achieved with additional specific measures (see specific documentation).

²⁾ CM = Common Mode, DM = Differential Mode

³⁾ When DC I/O inputs are used with AC voltage, external filters limiting high energy surges to 1 kV CM / 0.5 DM are required to meet requirements according IEC 61131-2.

4.6 Mechanical data

Parameter	Value
Mounting	Horizontal
Degree of protection	PLC system: IP 20 - with all modules plugged in - with all terminals plugged in - with all covers closed
Housing	Classification V-2 according to UL 94
Vibration resistance acc. to EN 61131-2	all three axes (DIN rail mounting) 5 Hz ... 8.4 Hz, continuous 3.5 mm 8.4 Hz ... 150 Hz, continuous 1 g

Parameter	Value
Shock test	All three axes 15 g, 11 ms, half-sinusoidal
Mounting of the modules:	
DIN rail according to DIN EN 50022	35 mm, depth 7.5 mm or 15 mm
Mounting with screws	Screws with a diameter of 4 mm
Fastening torque	1.2 Nm

4.7 Approvals and certifications

Information on approvals and certificates can be found in the PLC Automation *catalog*, in the table "Certifications" in the chapter "Additional information".