

DATA SHEET

# DC561

## Digital Input/Output module



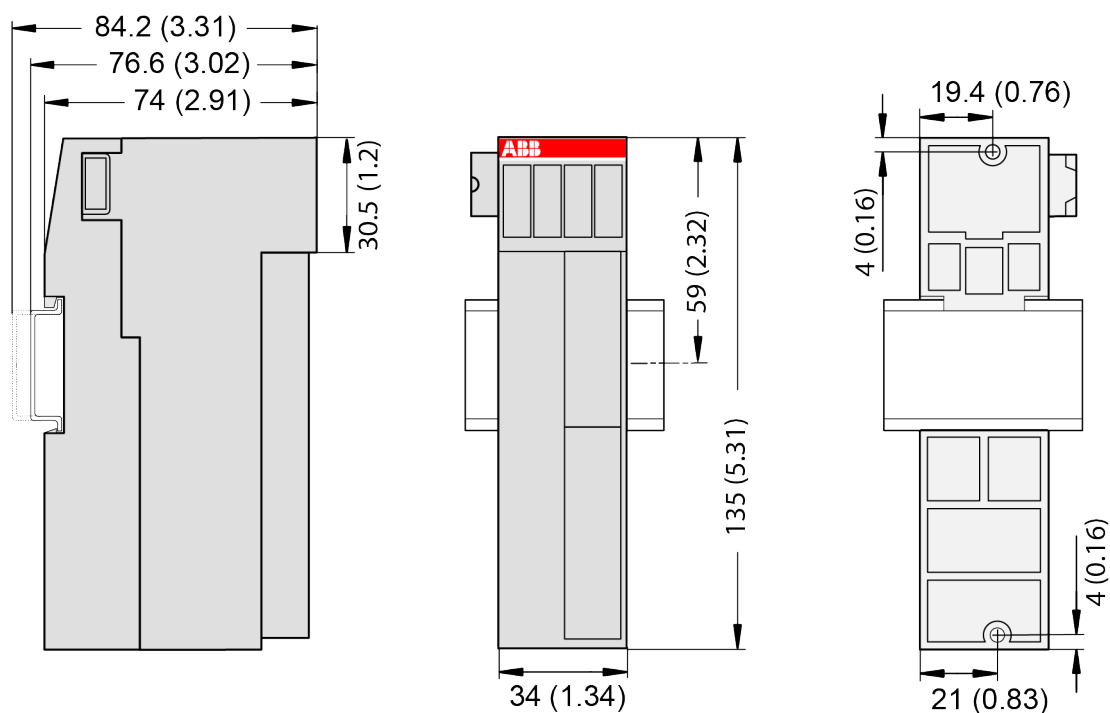
## 1 Ordering data

Part no.	Description	Product life cycle phase *)
1TNE 968 902 R2001	DC561, digital input/output module, 16 configurable inputs/outputs, transistor output, interfast connector	Classic



\*) 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 [Chapter 4 “System data AC500-eCo” on page 5](#)

Only additional details are therefore documented below.

Parameter		Value
Process voltage UP		
Connections		Terminals 17 and 19 for UP (+24 V DC); terminals 18 and 20 for ZP (0 V)
Rated value		24 V DC
Current consumption via UP terminal		10 mA + 0.1 A per output (max.)
Max. ripple		5 %
Inrush current		0.000001 A <sup>2</sup> s
Protection against reversed voltage		Yes
Protection fuse on UP		Recommended; the outputs must be protected by an 1 A fast-acting fuse
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
Galvanic isolation		Yes, between the input/output group and the rest of the module

Parameter	Value
Isolated groups	1 group for 16 channels
Surge voltage (max.)	35 V DC for 0.5 s
Max. power dissipation within the module	On request
Input data length	2 bytes
Output data length	2 bytes
Weight	Ca. 115 g
Mounting position	Horizontal or vertical
Cooling	The natural convection cooling must not be hindered by cable ducts or other parts in the switch-gear cabinet.

#### No effects of multiple overloads

No effects of multiple overloads on isolated multi-channel modules occur, as every channel is protected individually by an external fuse.

### 3.1 Technical data of the digital inputs/outputs if used as inputs

Parameter	Value
Number of channels per module	16 configurable inputs (24 V DC)
Distribution of the channels into groups	1 (16 channels per group)
Connections of the channels C0 to C15	Terminals 1 to 16
Reference potential for the channels C0 to C15	Terminals 18 and 20 (negative pole of the process voltage, name ZP)
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 via the I/O bus.
Input type according to EN 61131-2	Type 1 sink
Input signal range	+24 V DC
Signal 0	-3 V...+5 V
Undefined signal	+5 V...+15 V
Signal 1	+15 V...+30 V
Ripple with signal 0	-3 V...+5 V
Ripple with signal 1	+15 V...+30 V
Input current per channel	
Input voltage +24 V	Typ. 5 mA
Input voltage +5 V	Typ. 1 mA
Input voltage +15 V	> 2.5 mA
Input voltage +30 V	< 8 mA
Max. permissible leakage current (at 2-wire proximity switches)	1 mA
Input delay (0->1 or 1->0)	Typ. 8 ms
Max. cable length	

Parameter		Value
	Shielded	500 m
	Unshielded	300 m

### 3.2 Technical data of the digital inputs/outputs if used as outputs

Parameter		Value
Number of channels per module		16 configurable transistor outputs
Distribution of the channels into groups		1 (16 channels per group)
Connections of the channels C0 to C15		Terminals 1 to 16
Reference potential for the channels C0 to C15		Terminals 18 and 20 (negative pole of the process voltage, signal name ZP)
Common power supply voltage		Terminals 17 and 19 (positive pole of the process voltage, signal name UP)
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 via the I/O bus.
Way of operation		Non-latching type
Output voltage at signal 1		UP -0.3 V at max. current
Output delay (max. at rated load)		
	0 to 1	50 µs
	1 to 0	200 µs
Output current		
	Rated current per channel (max.)	0.1 A at UP 24 V DC
	Rated current per group (max.)	1.6 A
	Rated current (all channels together, max.)	1.6 A
	Lamp load (max.)	Not applicable
	Max. leakage current with signal 0	< 0.5 mA
Output type		Non-protected
Protection type		External fuse on each channel
Rated protection fuse (for each channel)		1 A fast
Demagnetization when inductive loads are switched off		Must be performed externally according to load specification
Switching frequency		
	With inductive loads	Max. 0.5 Hz
Short-circuit-proof / overload-proof		No
	Overload message	No
	Output current limitation	No
	Resistance to feedback against 24 V DC signals	Yes
Connection of 2 outputs in parallel		Not possible
Max. cable length		

Parameter		Value
	Shielded	500 m
	Unshielded	150 m

## 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 %)
	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...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!

Exceeding the maximum power supply voltage (> 30 V DC) for process or supply voltages could lead to unrecoverable damage of the system. The system might be destroyed.

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

Parameter		Value
Humidity		Max. 95 %, without condensation
Air pressure		
	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 $\mu$ s
100 V...127 V circuits against other circuitry	1500 V	1.2/50 $\mu$ s
100 V...240 V circuits against other circuitry	2500 V	1.2/50 $\mu$ 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 $\mu$ s
COM interfaces, galvanically isolated	500 V	1.2/50 $\mu$ s
COM interfaces, electrically not isolated	Not applicable	Not applicable
FBP interface	500 V	1.2/50 $\mu$ s
Ethernet	500 V	1.2/50 $\mu$ s
ARCNET	500 V	1.2/50 $\mu$ 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

Parameter	Value	
COM interfaces, electrically not isolated	Not applicable	Not applicable
FBP interface	350 V	AC 2 s
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

Electromagnetic Compatibility		
Device suitable for:		
	Industrial applications	Yes
	Domestic applications	No
<b>Immunity against electrostatic discharge (ESD):</b>		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 switchgear cabinet 6 kV <sup>1)</sup>
	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.

<b>Electromagnetic Compatibility</b>		
<b>Immunity against the influence of radiated (CW radiated):</b>		According to IEC 61000-4-3, zone B, criterion A
	Test field strength	10 V/m
<b>Immunity against transient interference voltages (burst):</b>		According to IEC 61000-4-4, zone B, criterion B
	Supply voltage units (DC)	2 kV
	Supply voltage units (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
<b>Immunity against the influence of line-conducted interferences (CW conducted):</b>		According to IEC 61000-4-6, zone B, criterion A
	Test voltage	10 V
<b>High energy surges</b>		According to IEC 61000-4-5, zone B, criterion B
	Power supply AC	2 kV CM / 1 kV DM <sup>2)</sup>
	Power supply DC	1 kV CM / 0.5 kV DM <sup>2)</sup>
	DC I/O supply, add. DC-supply-out	1 kV CM / 0.5 kV DM <sup>2)</sup>
	Communication lines, shielded	1 kV CM <sup>2)</sup>
	AC I/O unshielded <sup>3)</sup>	2 kV CM / 1 kV DM <sup>2)</sup>
	I/O analog, I/O DC unshielded <sup>3)</sup>	1 kV CM / 0.5 kV DM <sup>2)</sup>
<b>Radiation (radio disturbance)</b>		According to IEC 55011, group 1, class A

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

<sup>2)</sup> CM = Common Mode, DM = Differential Mode

<sup>3)</sup> 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	IP 20 (if all terminal screws are tightened)
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
Shock test	All three axes 15 g, 11 ms, half-sinusoidal

Parameter	Value
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 corresponding chapter of the *Main catalog, PLC Automation*.