

OFFICIAL DOCUMENT PACKAGE

Manufacturer's Manual

Amikon cover with selected official ABB technical pages

ABB AC500 / S500 I/O

DO524

DIGITAL TRANSISTOR OUTPUT MODULE

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

OFFICIAL SOURCE

ABB 3ADR010052 rev.14, 2025-11-28; DO524 connection instructions

DO524 ordering, output specifications and standard system conditions, original pages 1-7

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

DO524

Digital output module



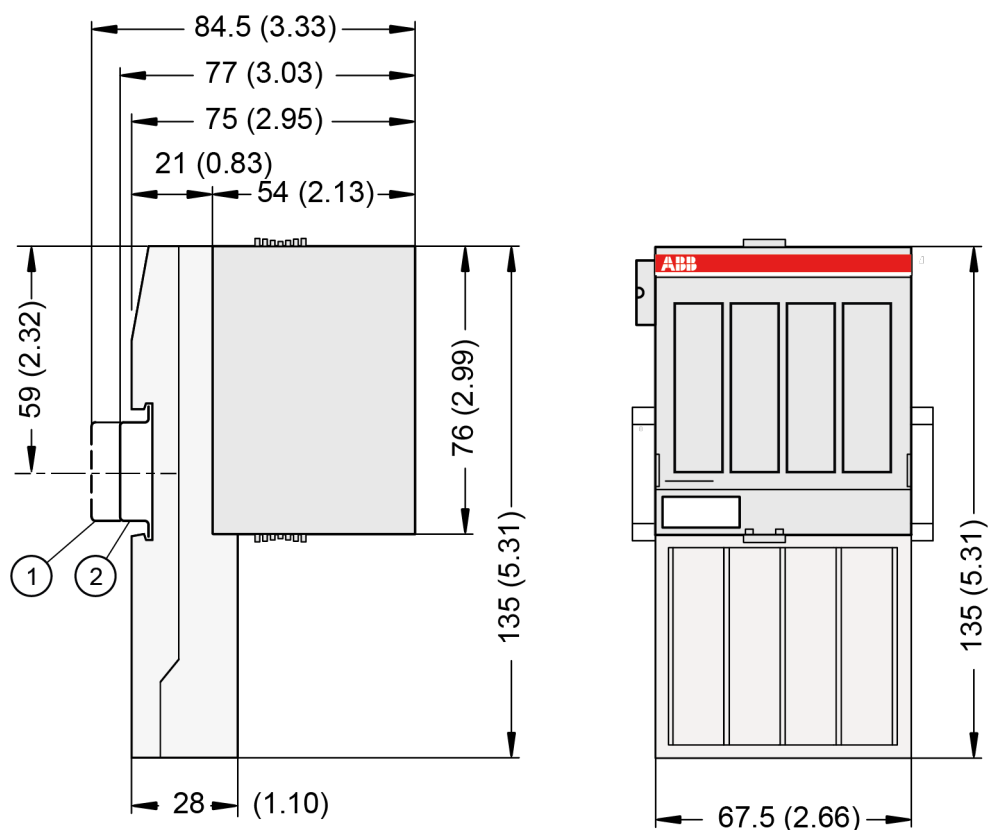
1 Ordering data

Part no.	Description	Product life cycle phase *)
1SAP 240 700 R0001	DO524, digital output module, 32 DO, 24 V DC / 0.5 A, 1-wire	Active
1SAP 440 700 R0001	DO524-XC, digital output module, 32 DO, 24 V DC / 0.5 A, 1-wire, 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 8

Only deviating specifications are therefore described here.

The technical data is also applicable to the XC version.

Parameter		Value
Process supply voltage UP		
	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
From UP at normal operation / with outputs	0.10 A + max. 0.5 A per output
Inrush current from UP (at power up)	0.005 A ² s
Max. power dissipation within the module	6 W (outputs unloaded)
Weight (without terminal unit)	Ca. 100 g
Mounting position	Horizontal mounting or Vertical mounting with derating (output load reduced to 50 % at +40 °C per group)
Cooling	The natural convection cooling must not be hindered by cable ducts or other parts in the control cabinet.

**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.

**Multiple overloads**

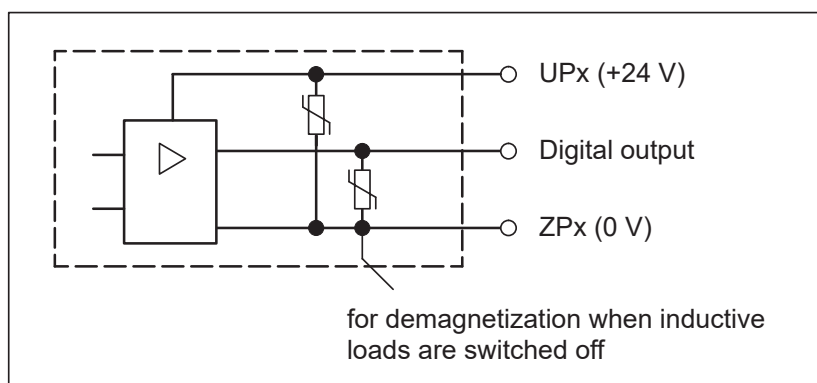
With multi-channel modules, there are no effects of multiple overloads as each digital output channel is individually protected by an internal intelligent high-side switch.

3.2 Technical data of the digital outputs

Parameter	Value
Number of channels per module	32 outputs (with transistors)
Distribution of the channels into groups	1 group of 32 channels
Connection of the channels	
O0 ... O7	Terminals 1.0 ... 1.7
O8 ... O15	Terminals 2.0 ... 2.7
O16 ... O23	Terminals 3.0 ... 3.7
O24 ... O31	Terminals 4.0 ... 4.7
Indication of the output signals	1 yellow LED per channel, the LED is ON if the output signal is high (signal 1)
Reference potential for all outputs	Terminals 1.9, 2.9, 3.9 and 4.9 (negative pole of the process supply voltage, signal name ZP)

Parameter	Value
Common power supply voltage	For all outputs: terminals 1.8, 2.8, 3.8 and 4.8 (positive pole of the process supply voltage, signal name UP)
Output voltage for signal 1	UP (-0.8 V)
Output delay (0 -> 1 or 1 -> 0)	On request
Output current	
Rated value, per channel	500 mA at UP = 24 V
Maximum value (channels O0 ... O15)	4 A
Maximum value (channels O16 ... O31)	4 A
Maximum value (all channels together)	8 A
Max. leakage current with signal 0	< 0.5 mA
Rated protection fuse on UP	10 A fast
Demagnetization when inductive loads are switched off	With varistors integrated in the module (see figure below)
Switching frequency	
With resistive load	On request
With inductive loads	Max. 0.5 Hz
With lamp loads	Max. 11 Hz with max. 5 W
Short-circuit proof / overload proof	Yes
Overload message ($I > 0.7$ A)	Yes, after ca. 100 ms
Output current limitation	Yes, automatic reactivation after short-circuit/overload
Resistance to feedback against 24 V signals	Yes
Max. cable length	
Shielded	1000 m
Unshielded	600 m

The following drawing shows the circuitry of a digital output with the varistors for demagnetization when inductive loads are switched off.



4 System data AC500

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
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** ↗ Chapter 4 “System data AC500” on page 5 and the **technical data** of the module used.



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. 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 Power supply units



AC500 and AC500-eCo PLC devices are Class II/Class III devices and do not require a Protective Earth (PE) connection.

For proper EMC performance, all metal parts, DIN rails, mounting screws, and cable shield connection terminals are connected to a common ground and provide Functional Earth (FE). This is typically connected to a common reference potential, such as equipotential bonding rails.

Signal Grounds (SGND or GND) are used for signal reference and must not be connected to cable shields, FE or other signals unless otherwise specified in the specific device description.

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.

4.4 Electromagnetic compatibility

Table 2: Electromagnetic compatibility

Parameter	Value
Device suitable only as <i>Control Equipment for Industrial Applications</i> , including marine applications. IEC 61131-2, zone B 🔗 Chapter 4.6 “Approvals and certifications” on page 8	
Radiated emission according to IEC 61000-6-4 CISPR11, class A	Yes
Conducted emission according to IEC 61000-6-4 CISPR11, class A	Yes
Electrostatic discharge (ESD) according to IEC 61000-4-2, criterion B	Air discharge: 8 kV Contact discharge: 6 kV
Fast transient interference voltages (burst) according to IEC 61000-4-4, criterion B	Power supply (DC): 2 kV Digital inputs/outputs (24 V DC): 1 kV Digital inputs/outputs (240 V AC): 2 kV Analog inputs/outputs: 1 kV Communication lines shielded: 1 kV
High energy transient interference voltages (surge) according to IEC 61000-4-5, criterion B	Power supply (DC): - Line to ground: 1 kV - Line to line: 0,5 kV Digital inputs/outputs/relay: (24 V DC): - Line to ground: 1 kV (AC): - Line to ground: 2 kV - Line to line: 1 kV Analog inputs/outputs: - Line to ground: 1 kV Communication lines: - Line to ground: 1 kV
Influence of radiated disturbances IEC 61000-4-3, criterion A	Test field strength: 10 V/m
Influence of line-conducted interferences IEC 61000-4-6, criterion A	Test voltage: 10 V
Power frequency magnetic fields IEC 61000-4-8, criterion A	30 A/m 50 Hz 30 A/m 60 Hz