

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS SIMATIC S7

6DL1162-6BL00-0PH1

32-CHANNEL DIGITAL OUTPUT MODULE

Used with the applicable Siemens Simatic S7 configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens official manufacturer documentation

Validity of the documentation

This manual describes the following I/O module:

System family	I/O module	Article number
SIMATIC Distributed I/O System ET200PA SMART+	DQ 32x24VDC/0.5A PA	6DL1162-6BL00-0PH1

It supplements the system manual for the *ET 200PA SMART+ Distributed I/O System*.

Functions that generally relate to the system are described in this manual.

The information in this manual and in the system/function manuals enables you to commission the ET 200PA SMART+.

Conventions

Please also observe notes marked as follows:

Note

A note contains important information on the product described in the documentation, on the handling of the product or on the section of the documentation to which particular attention should be paid.

Product overview

4.1 I/O module [ID: 151045167371]

Definition

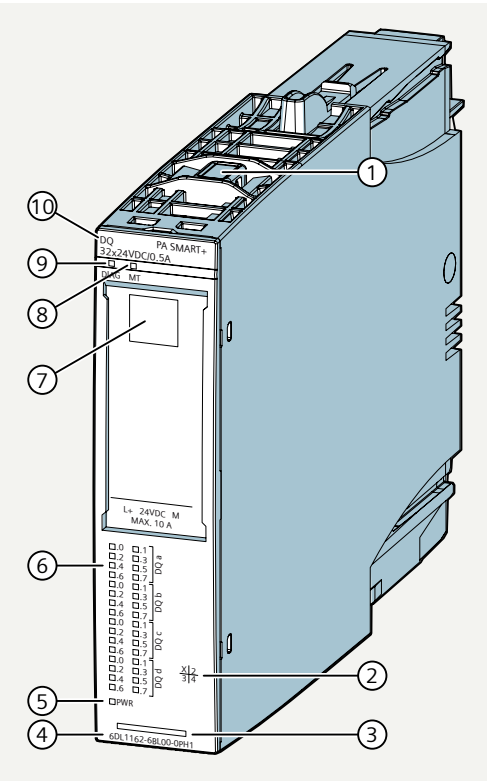
The DQ 32x24VDC/0.5A PA I/O module is a digital output module with 32 power outputs for process control.

In addition to the technical specifications, this module has the following properties:

- Source output (PNP, switching to P potential)
- Suitable for solenoid valves, DC contactors, and indicator lights
- Re-parameterization in RUN

Description

The I/O module consists of the following components:



- ① Output disable switch
- ② Function status and firmware version
- ③ Serial number
- ④ Article number
- ⑤ LED for supply voltage
- ⑥ LEDs for channel status
- ⑦ 2D matrix code
- ⑧ LED for maintenance
- ⑨ LED for diagnostics
- ⑩ Module type and designation

4.2 Accessories [ID: 151045199627]

Definition

Accessories for the I/O module must be ordered separately.

Status and error displays (Page 25)

4.5 Terminal blocks [ID: 151045230475]

Definition

The terminal blocks provide the process terminals (push-in terminals) for the connection of components, such as devices.

Description

For details on the terminal blocks that can be used, please refer to the current manual *SIMATIC, Distributed I/O System ET 200PA SMART+* at <https://support.industry.siemens.com/> (<https://support.industry.siemens.com/>)

Note

The terminal blocks are not included in the scope of delivery of the I/O module and must be ordered separately.

Connection

5.1 Pin assignment [ID: 151045243019]

Definition

The pin assignment provides information about the arrangement and identification of the terminals when wiring a connector.

Description

The general pin assignment is structured as follows:

Terminal	Allocation	Terminal	Allocation	Explanations
1	DQ a/DQ.0+	2	DQ a/DQ.1+	DQ a /DQ.n+: Output signal, channel n (0...7)
3	DQ a/DQ.2+	4	DQ a/DQ.3+	
5	DQ a/DQ.4+	6	DQ a/DQ.5+	
7	DQ a/DQ.6+	8	DQ a/DQ.7+	
9	DQ b/DQ.0+	10	DQ b/DQ.1+	DQ b /DQ.n+: Output signal, channel n (8...15)
11	DQ b/DQ.2+	12	DQ b/DQ.3+	
13	DQ b/DQ.4+	14	DQ b/DQ.5+	
15	DQ b/DQ.6+	16	DQ b/DQ.7+	
17	DQ c/DQ.0+	18	DQ c/DQ.1+	DQ c /DQ.n+: Output signal, channel n (16...23)
19	DQ c/DQ.2+	20	DQ c/DQ.3+	
21	DQ c/DQ.4+	22	DQ c/DQ.5+	
23	DQ c/DQ.6+	24	DQ c/DQ.7+	
25	DQ d/DQ.0+	26	DQ d/DQ.1+	DQ d /DQ.n+: Output signal, channel n (24...31)
27	DQ d/DQ.2+	28	DQ d/DQ.3+	
29	DQ d/DQ.4+	30	DQ d/DQ.5+	
31	DQ d/DQ.6+	32	DQ d/DQ.7+	
1P1	L+	1P2	M	M: Ground
2P1	L+	2P2	M	

1P1: Supply voltage L+ of the voltage bus 1P

2P1: Supply voltage L+ of the voltage bus 2P

1P2: Ground reference of the voltage bus 1P

2P2: Ground reference of the voltage bus 2P

1P1 L+ 24VDC M 1P2
2P1 L+ 24VDC M 2P2
MAX. 10 A

5.2 Pin assignment of the terminal block with D-SUB connector

General pin assignment with potential distributor

The potential distributor with 36 M terminals is located on the right side of the terminal block. The left side corresponds to the general pin assignment.

Note

Connection information

- The M terminals on the potential distributor are intended exclusively for the loads connected to the I/O module using a two-wire connection system. You may not use these terminals as the ground terminals for other devices in the system.
 - Ensure that the total current does not exceed 10 A.
-

5.2 Pin assignment of the terminal block with D-SUB connector

[ID: 166116747915]

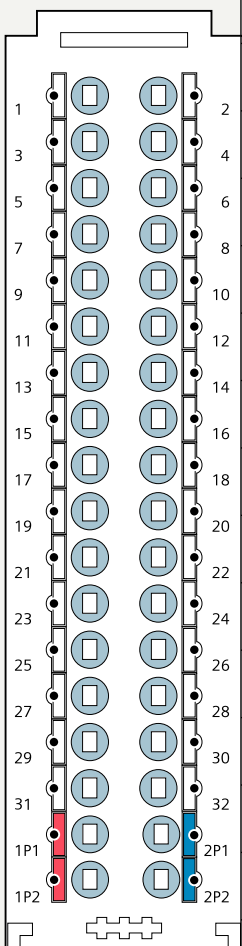
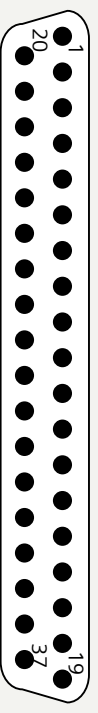
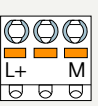
Definition

The terminal assignment provides information about the arrangement and marking of the terminals when wiring a connector.

5.2 Pin assignment of the terminal block with D-SUB connector

Description

The general pin assignment of a terminal block field with push-in terminals paired with the 37-pin D-SUB connector is as follows:

Terminal block with push-in terminals					Terminal block with D-SUB connector				
N o.	Signals	Scheme	Signals	No.	N o.	Signals	Scheme	Signals	No.
1	Terminal_01		Terminal_02	2	20	Terminal_17		Terminal_01	1
3	Terminal_03		Terminal_04	4	21	Terminal_18		Terminal_02	2
5	Terminal_05		Terminal_06	6	22	Terminal_19		Terminal_03	3
7	Terminal_07		Terminal_09	8	23	Terminal_20		Terminal_04	4
9	Terminal_09		Terminal_10	10	24	Terminal_21		Terminal_05	5
11	Terminal_11		Terminal_12	12	25	Terminal_22		Terminal_06	6
13	Terminal_13		Terminal_14	14	26	Terminal_23		Terminal_07	7
15	Terminal_15		Terminal_16	16	27	Terminal_24		Terminal_08	8
17	Terminal_17		Terminal_18	18	28	Terminal_25		Terminal_09	9
19	Terminal_19		Terminal_20	20	29	Terminal_26		Terminal_10	10
21	Terminal_21		Terminal_22	22	30	Terminal_27		Terminal_11	11
23	Terminal_23		Terminal_24	24	31	Terminal_28		Terminal_12	12
25	Terminal_25		Terminal_26	26	32	Terminal_29		Terminal_13	13
27	Terminal_27		Terminal_28	28	33	Terminal_30		Terminal_14	14
29	Terminal_29		Terminal_30	30	34	Terminal_31		Terminal_15	15
31	Terminal_31		Terminal_32	32	35	Terminal_32		Terminal_16	16
1P 1	L+		M	1P2	36				17
2P 1	L+		M	2P2	37				18
									19

5.3 Sample connection scheme for 1-wire connection

Note

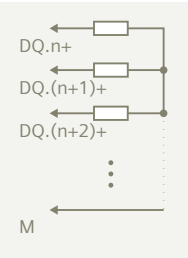
Wiring of the connections

- When wiring the connections on the D-SUB connector, note the shift starting with no. 17.
- The power supply is connected to the terminal block with D-SUB connector via the separate X21 connector.

Push-in terminals	D-SUB connector	Push-in terminals	D-SUB connector
Terminal no.	Pin no.	Terminal no.	Pin no.
1	1	17	20
2	2	18	21
3	3	19	22
4	4	20	23
5	5	21	24
6	6	22	25
7	7	23	26
8	8	24	27
9	9	25	28
10	10	26	29
11	11	27	30
12	12	28	31
13	13	29	32
14	14	30	33
15	15	31	34
16	16	32	35
	17		36
	18		37
	19		

5.3 Sample connection scheme for 1-wire connection [ID: 151045287563]

Example



Technical specifications

[ID: 151045833739]

Technical specifications of the DQ 32x24VDC/0.5A PA

Article number	6DL1162-6BL00-0PH1
General information	
Product type designation	DQ 32x24VDC/0.5A PQ
Firmware version	
• FW update possible	Yes
Usable terminal block	see the system manual
Product function	
• I&M data	Yes; I&M 0
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	- / -
• STEP 7 configurable/integrated from version	- / -
• PCS 7 configurable/integrated from version	V9.1 SP2
• PCS neo can be configured/integrated from version	V4.1
Operating mode	
• DQ	Yes
Redundancy	
• Redundancy capability	No
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Input current	
Current consumption (rated value)	60 mA
Current consumption, max.	70 mA
output voltage / header	
Rated value (DC)	24 V
Power loss	
Power loss, typ.	1.6 W; minimum - typ. specification not possible because load-dependent
Address area	
Address space per module	
• Inputs	4 byte; QI of the outputs

Article number	6DL1162-6BL00-0PH1
• Outputs	4 byte
Digital outputs	
Number of digital outputs	32
Current-sinking	No
Current-sourcing	Yes
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; Clocked electronically
• Response threshold, typ.	2 A; Overload / short circuit
Open-circuit detection	No
Overload protection	Yes
Limitation of inductive shutdown voltage to	Typ. L+ (-53 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	4 kΩ
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.1 mA
Output delay with resistive load	
• "0" to "1", typ.	54 μs
• "1" to "0", typ.	48 μs
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	Yes; only outputs of the same group
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	2 Hz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	0.5 A
• Current per module, max.	10 A
Total current of the outputs (per module)	
horizontal installation	
– up to 70 °C, max.	10 A
vertical installation	
– up to 60 °C, max.	10 A
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m

Article number	6DL1162-6BL00-0PH1
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
– parameterizable	Yes
• Wire-break	No
• Short-circuit	Yes
• Short-circuit to M	Yes; channel by channel
• Short-circuit to L+	No
• Group error	Yes
Diagnostics indication LED	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	No
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
Isolation	
Isolation tested with	1 500 V DC/1 min, type test
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
Dimensions	
Width	22.5 mm
Height	115 mm
Depth	138 mm
Weights	
Weight, approx.	150 g

Power supply (SELV/PELV)

Ensure that the power supply is safely disconnected in accordance with the following standard: IEC/UL61010-2-201 This separation is referred to in the standard as SELV (Safety Extra Low Voltage) / PELV (Protective Extra Low Voltage).

Make sure that the supply and input voltages of the ET 200PA SMART+ IO Device are generated safely separately:

Nominal value: 24 VDC $\pm 20\%$ ($\overline{---}$)

Cycle time

The cycle time describes the time slice in which new process values are output. The cycle time of the I/O module is 150 μ s.

Response to short-circuit detection

The I/O module is equipped with an overload protection that triggers as of about 2 A. When this limit is exceeded, the I/O module automatically limits the current (typically: to 1.3 A). If the overload continues, it results in a temperature increase in the I/O module. The respective output switches on and off again cyclically (clocked).

Note

Cable length

Ensure sufficient low-resistance cable routing to the sensor/actuators to reach the response threshold. Depending on the cable cross-section used, there may be restrictions in the cable lengths that can be used.
