

## I/O systems

SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200pro

### I/O modules > Digital expansion modules

#### Overview



- Expansion modules with digital inputs/outputs for connection of actuators/sensors
- With scalable diagnostics
  - Standard modules with module-specific diagnostics
  - High-feature module with channel-specific diagnostics and parameterizable input delay or hardware interrupts
- Double or single assignment can be implemented for each M12 in the case of the 8 DI and 8 DO module by selecting CM IO 4 x M12 or CM IO 8 x M12
- IO connection modules are available in metal and plastic versions

#### Technical specifications

Article number	6ES7141-4BF00-0AA0	6ES7141-4BF00-0AB0	6ES7141-4BH00-0AA0
	ET 200PRO, EM 8DI 24 V DC	ET 200PRO, EM 8DI 24 V DC HF	ET 200PRO, EM 16DI DC 24 V
<b>Supply voltage</b>			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; against destruction; load increasing	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
<b>Input current</b>			
from supply voltage 1L+, max.	20 mA	40 mA	30 mA
from backplane bus 3.3 V DC, max.	20 mA	20 mA	20 mA
<b>Encoder supply</b>			
Number of outputs	8	8	8
Short-circuit protection	Yes; per module, electronic	Yes; per channel, electronic	Yes; per module, electronic
<b>Output current</b>			
• up to 55 °C, max.	1 A	1 A	1 A
<b>Power loss</b>			
Power loss, typ.	2.5 W	2.5 W	3 W
<b>Address area</b>			
<b>Occupied address area</b>			
• Inputs	1 byte	1 byte	2 byte
<b>Digital inputs</b>			
Number of digital inputs	8	8	16
Input characteristic curve in accordance with IEC 61131, type 1	Yes	No	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No	Yes	
<b>Number of simultaneously controllable inputs</b>			
<b>all mounting positions</b>			
- up to 55 °C, max.	8	8	16
<b>Input voltage</b>			
• Rated value (DC)	24 V	24 V	24 V
• for signal *0*	-3 to +5V	-3 to +5V	-3 to +5V
• for signal *1*	13 to 30V	+11 to +30V	+11 to +30V
<b>Input current</b>			
• for signal *1*, typ.	7 mA	7 mA	4 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>			
- parameterizable	No	Yes	No
- at *0* to *1*, min.	1.2 ms	0.5 ms; 0.5 ms/ 3ms/ 15 ms/ 20 ms	1.2 ms
- at *0* to *1*, max.	4.8 ms	20 ms	4.8 ms
- at *1* to *0*, min.	1.2 ms	0.5 ms; 0.5 ms/ 3ms/ 15 ms/ 20 ms	0.7 ms
- at *1* to *0*, max.	4.8 ms	20 ms	3 ms

**Technical specifications (continued)**

Article number	<b>6ES7141-4BF00-0AA0</b> ET 200PRO, EM 8DI 24 V DC	<b>6ES7141-4BF00-0AB0</b> ET 200PRO, EM 8DI 24 V DC HF	<b>6ES7141-4BH00-0AA0</b> ET 200PRO, EM 16DI DC 24 V
<b>Cable length</b>			
• shielded, max.	30 m	30 m	30 m
• unshielded, max.	30 m	30 m	30 m
<b>Encoder</b>			
<b>Connectable encoders</b>			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)	No	No	No
<b>Interrupts/diagnostics/status information</b>			
Diagnostic functions	Yes	Yes; channel by channel, parameterizable	Yes
<b>Alarms</b>			
• Diagnostic alarm	Yes	Yes	Yes
<b>Diagnostic messages</b>			
• Diagnostic information readable	Yes	Yes	Yes
• Wire-break		Yes; Monitoring, I < 0.3 mA	
• Short-circuit	Yes; Sensor supply to M; module by module	Yes	Yes; Sensor supply to M; module by module
<b>Diagnostics indication LED</b>			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital input (green)	Yes; Per channel	Yes; Per channel	Yes; Per channel
<b>Parameter</b>			
Diagnostics wire break		channel by channel	
Diagnostics short-circuit	Sensor supply to M; module by module	channel by channel	
<b>Potential separation</b>			
between backplane bus and all other circuit components	Yes	Yes	Yes
<b>Potential separation digital inputs</b>			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes
<b>Isolation</b>			
Isolation tested with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
<b>Dimensions</b>			
Width	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm
Depth	35 mm	35 mm; without terminal module	35 mm
<b>Weights</b>			
Weight, approx.	140 g	140 g	140 g

Article number	<b>6ES7142-4BD00-0AA0</b> ET 200PRO, EM 4DO 24V DC/2.0A	<b>6ES7142-4BD00-0AB0</b> ET 200PRO, EM 4DO 24VDC/2.0A HF	<b>6ES7142-4BF00-0AA0</b> ET 200PRO, EM 8DO DC24V/0.5A
<b>Supply voltage</b>			
<b>Load voltage 2L+</b>			
• Rated value (DC)	24 V	24 V	24 V
• Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic
• Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction; load increasing	Yes; against destruction; load increasing
<b>Input current</b>			
from load voltage 2L+ (without load), max.	20 mA	40 mA	30 mA
from backplane bus 3.3 V DC, max.	20 mA	30 mA	30 mA
<b>Power loss</b>			
Power loss, typ.	2 W	2.5 W	2 W
<b>Address area</b>			
<b>Address space per module</b>			
• with packing	4 bit	4 bit	8 bit
• without packing	1 byte	1 byte	1 byte

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200pro**I/O modules > Digital expansion modules**

Ordering data	Article No.	Ordering data	Article No.
<b>8 DI digital input module</b> 24 V DC, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7141-4BF00-0AA0	<b>CM IO 8 x M12 connection module</b> 8 M12 sockets for connecting digital sensors or actuators to ET 200pro	6ES7194-4CB00-0AA0
<b>8 DI High Feature digital input module</b> 24 V DC, with channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7141-4BF00-0AB0	<b>CM IO 8 x M12 P connection module</b> 8 M12 sockets for connecting digital sensors or actuators to ET 200pro; plastic version	6ES7194-4CB10-0AA0
<b>16 DI digital input module</b> 24 V DC, with module-specific diagnostics, including bus module. Connection module 6ES7194-4CB50-0AA0 must be ordered separately	6ES7141-4BH00-0AA0	<b>CM IO 8 x M12D connection module</b> 8 M12 sockets for connecting digital sensors or actuators to ET 200pro	6ES7194-4CB50-0AA0
<b>4 DO digital output module</b> 24 V DC, 2 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7142-4BD00-0AA0	<b>CM IO 8 x M8 connection module</b> 8 sockets M8 for connection of digital sensors or actuators to ET 200pro	6ES7194-4EB00-0AA0
<b>4 DO High Feature digital output module</b> 24 V DC, 2 A, with channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7142-4BD00-0AB0	<b>CM IO 2 x M12 connection module</b> 2 M12 8-pin sockets; for use with: EM 8 DI, 24 V DC and 8 DO, 24 V DC/0.5 A	6ES7194-4FB00-0AA0
<b>8 DO digital output module</b> 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7142-4BF00-0AA0	<b>CM IO 1 x M23 connection module</b> 1 M23 socket; for use with: EM 8 DI, 24 V DC and 8 DO, 24 V DC/0.5 A	6ES7194-4FA00-0AA0
<b>4 DI/4 DO digital input and output module</b> 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7143-4BF50-0AA0	<b>Module identification labels</b> For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each	6ES7194-4HA00-0AA0
<b>Digital input and output module 4 DIO / 4 DO</b> 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7143-4BF00-0AA0	<b>M12 sealing cap</b> For protection of unused M12 connections with ET 200pro	3RX9802-0AA00
<b>Accessories</b>		<b>Labels</b> 20 x 7, pale turquoise, 340 items per pack	3RT1900-1SB20
<b>CM IO 4 x M12 connection module</b> 4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro	6ES7194-4CA00-0AA0	<b>M12 Y circular connector</b> For double connection of sensors via a single cable, 5-pole; cannot be used for F DI 4/8	6ES7194-1KA01-0XA0
<b>CM IO 4 x M12 inverse connection module</b> 4 M12 sockets for connection of digital actuators to ET 200pro (4 DO and 4 DO HF); 2 x M12 single assignment, 2 x M12 double assignment	6ES7194-4CA50-0AA0	<b>M12 Y cable</b> For double connection of I/O by means of a single cable on ET 200, 5-pole	6ES7194-6KA00-0XA0
<b>CM IO 4 x M12 P connection module</b> 4 M12 sockets for connecting digital sensors or actuators to ET 200pro; plastic version	6ES7194-4CA10-0AA0	<b>M8 sealing cap</b> For IP67 modules	3RK1901-1PN00