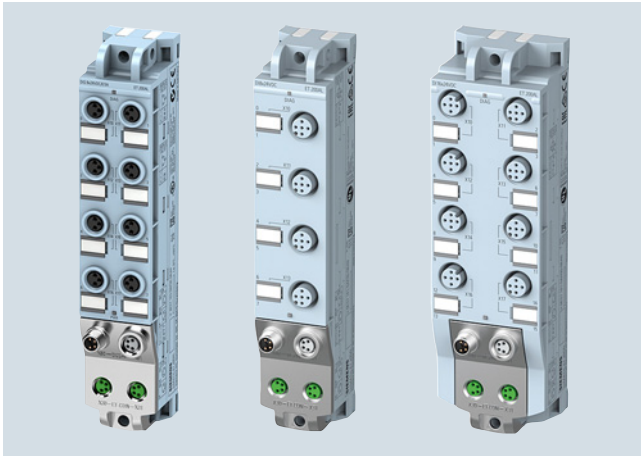


### Overview



- 30 and 45 mm-wide modules with parameters and diagnostic functions
- 8-channel digital input module with M8 or M12 connection
- 16-channel digital input module with M12 connection
- 8-channel digital input/output module with M8 or M12 connection
- 16-channel digital input/output module with M12 connection
- 8-channel digital output module 2 A with M12 connection

### Technical specifications

Article number	<b>6ES7141-5BF00-0BA0</b> ET 200AL, DI 8X24VDC, 8XM8	<b>6ES7141-5AF00-0BA0</b> ET 200AL, DI 8X24VDC, 4XM12	<b>6ES7141-5AH00-0BA0</b> ET 200AL, DI 16X24VDC, 8XM12
<b>General information</b>			
Product type designation	DI 8x24VDC, 8xM8	DI 8x24VDC, 4XM12	DI 16x24VDC, 8XM12
HW functional status	E01	E01	E01
Firmware version	V1.0.x	V1.0.x	V1.0.x
<b>Product function</b>			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
<b>Engineering with</b>			
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated as of version	From V5.5 SP4 Hotfix 3	V5.5 SP4 Hotfix 7 or higher	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5	GSD as of Revision 5	GSD as of Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1	GSDML V2.3.1	GSDML V2.3.1
<b>Supply voltage</b>			
<b>Load voltage 1L+</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; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
<b>Input current</b>			
Current consumption (rated value) from load voltage 1L+ (unswitched voltage)	25 mA; without load 4 A; Maximum value	25 mA; without load 4 A; Maximum value	30 mA; without load 4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
<b>Encoder supply</b>			
Number of outputs	8	4	8
<b>24 V encoder supply</b>			
• Short-circuit protection	Yes; per module, electronic	Yes; per module, electronic	Yes; per module, electronic
• Output current, max.	0.7 A; Total current of all encoders	0.7 A; Total current of all encoders	1.4 A; Total current of all encoders
<b>Power loss</b>			
Power loss, typ.	1.9 W	1.9 W	2.7 W
<b>Digital inputs</b>			
Number of digital inputs	8	8	16
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**I/O modules > Digital I/O modules****Technical specifications (continued)**

Article number	<b>6ES7142-5AF00-0BA0</b>		Article number	<b>6ES7142-5AF00-0BA0</b>	
	ET 200AL, DQ 8X24VDC/2A, 8XM12			ET 200AL, DQ 8X24VDC/2A, 8XM12	
<b>Ambient conditions</b>			<b>Dimensions</b>		
<b>Ambient temperature during operation</b>			Width	45 mm	
• min.	-25 °C		Height	159 mm	
• max.	55 °C		Depth	40 mm	
<b>Connection method</b>			<b>Weights</b>		
Design of electrical connection for the inputs and outputs	M12, 5-pole		Weight, approx.	192 g	
Power supply	M8, 4-pole				
<b>ET-Connection</b>					
• ET-Connection	M8, 4-pin, shielded				

Article number	<b>6ES7143-5BF00-0BA0</b>	<b>6ES7143-5AF00-0BA0</b>	<b>6ES7143-5AH00-0BA0</b>
	ET 200AL, DIQ 4+DQ 4X24VDC/0.5A, 8XM8	ET 200AL, DIQ 4+DQ 4X24VDC/0.5A, 4XM12	ET 200AL, DIQ 16x24VDC/0.5A, 8XM12
<b>General information</b>			
Product type designation	DIQ 4+DQ 4X24VDC/0.5A, 8xM8	DIQ 4+DQ 4X24VDC/0.5 A, 4XM12	DIQ 16X24VDC/0.5A, 8XM12
HW functional status	E01	E01	E01
Firmware version	V1.0.x	V1.0.x	V1.0.x
<b>Product function</b>			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
<b>Engineering with</b>			
• STEP 7 TIA Portal configurable/integrated as of version	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V14 or higher
• STEP 7 configurable/integrated as of version	From V5.5 SP4 Hotfix 3	V5.5 SP4 Hotfix 7 or higher	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS as of GSD version/GSD revision	GSD as of Revision 5	GSD as of Revision 5	GSD as of Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3.1	GSDML V2.3.1	GSDML V2.3.1
<b>Operating mode</b>			
• DI			Yes
• Counter			Yes
• DQ			Yes
<b>Supply voltage</b>			
<b>Load voltage 1L+</b>			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
<b>Load voltage 2L+</b>			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction; load increasing	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
<b>Input current</b>			
Current consumption (rated value) from load voltage 1L+ (unswitched voltage)	40 mA; without load 4 A; Maximum value	40 mA; without load 4 A; Maximum value	75 mA; without load 4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
<b>Encoder supply</b>			
Number of outputs	4	4	8
<b>24 V encoder supply</b>			
• Short-circuit protection	Yes; per module, electronic	Yes; per module, electronic	Yes; Per load voltage, electronic
• Output current, max.	0.7 A; Total current of all encoders	0.7 A; Total current of all encoders	1.4 A; Total current of all encoders, max. 0.7 A per load voltage

**Technical specifications (continued)**

Article number	<b>6ES7143-5BF00-0BA0</b> ET 200AL, DIQ 4+DQ 4X24VDC/0.5A, 8XM8	<b>6ES7143-5AF00-0BA0</b> ET 200AL, DIQ 4+DQ 4X24VDC/0.5A, 4XM12	<b>6ES7143-5AH00-0BA0</b> ET 200AL, DIQ 16x24VDC/0.5A, 8xM12
<b>Power loss</b>			
Power loss, typ.	2.5 W	2.5 W	4 W
<b>Digital inputs</b>			
Number of digital inputs	4; Parameterizable as DIQ	4; Parameterizable as DIQ	16; Parameterizable as DIQ
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes
<b>Number of simultaneously controllable inputs</b>			
<b>all mounting positions</b>			
- up to 55 °C, max.	4	4	16
<b>Digital input functions, parameterizable</b>			
• Freely usable digital input			Yes
• Counter			Yes
- Number, max.			4
- Counting frequency, max.			2 kHz
- Counting width			32 bit; Incl. sign
- Counting direction up/down			Yes
<b>Input voltage</b>			
• Type of input voltage	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V
<b>Input current</b>			
• for signal "1", typ.	3.2 mA	3.2 mA	3 mA
<b>Input delay (for rated value of input voltage) for standard inputs</b>			
- parameterizable			Yes
- at "0" to "1", min.	1.2 ms	1.2 ms	0.05 ms; 1.6 ms for channels 8 through 15
- at "0" to "1", max.	4.8 ms	4.8 ms	20 ms
- at "1" to "0", min.	1.2 ms	1.2 ms	0.05 ms; 1.6 ms for channels 8 through 15
- at "1" to "0", max.	4.8 ms	4.8 ms	20 ms
<b>for counter/technological functions</b>			
- parameterizable			Yes
<b>Cable length</b>			
• unshielded, max.	30 m	30 m	30 m
<b>Digital outputs</b>			
Number of digital outputs	8; 4 DQ fixed, 4 DIQ parameterizable	8; 4 DQ fixed, 4 DIQ parameterizable	16; Parameterizable as DIQ
• in groups of	4; 2 load groups for 4 outputs each	4; 2 load groups for 4 outputs each	8; 2 load groups for 8 outputs each
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic
• Response threshold, typ.	0.7 A	0.7 A	0.7 A
Limitation of inductive shutdown voltage to	2L+ (-47 V)	2L+ (-47 V)	L+ (-53 V)
<b>Digital output functions, parameterizable</b>			
• Switching tripped by comparison values			Yes
• Freely usable digital output			Yes
<b>Switching capacity of the outputs</b>			
• on lamp load, max.	5 W	5 W	5 W
<b>Load resistance range</b>			
• lower limit	48 Ω	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ

**I/O systems**SIMATIC ET 200 systems without control cabinet  
SIMATIC ET 200AL**I/O modules > Digital I/O modules****Technical specifications (continued)**

Article number	<b>6ES7143-5BF00-0BA0</b> ET 200AL, DIQ 4+DQ 4X24VDC/0.5A, 8XM8	<b>6ES7143-5AF00-0BA0</b> ET 200AL, DIQ 4+DQ 4X24VDC/0.5A, 4XM12	<b>6ES7143-5AH00-0BA0</b> ET 200AL, DIQ 16x24VDC/0.5A, 8xM12
<b>Output voltage</b>			
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)
<b>Output current</b>			
• for signal "1" rated value	0.5 A	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA
<b>Switching frequency</b>			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz	1 Hz
<b>Total current of the outputs</b>			
• Current per group, max.	2 A	2 A	4 A
<b>Cable length</b>			
• 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>Interrupts/diagnostics/ status information</b>			
Substitute values connectable	Yes; channel by channel, parameterizable	Yes; channel by channel, parameterizable	Yes; channel by channel, parameterizable
<b>Alarms</b>			
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
<b>Diagnostic messages</b>			
• Short-circuit	Yes; Outputs to M; encoder supply to M; module by module	Yes; Outputs to M; encoder supply to M; module by module	Yes; Outputs to M; encoder supply to M; module by module
<b>Diagnostics indication LED</b>			
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for module diagnostics	Yes; Green/red LED	Yes; Green/red LED	Yes; Green/red LED
• For load voltage monitoring	Yes; Green LED	Yes; Green LED	Yes; Green LED
<b>Potential separation</b>			
between the load voltages	Yes	Yes	Yes
<b>Potential separation channels</b>			
• between the channels, in groups of	4; DIQ channels are isolated from DQ channels	4; DIQ channels are isolated from DQ channels	8
• between the channels and backplane bus	Yes	Yes	Yes
• between the channels and the power supply of the electronics	No; DIQ channels are non-isolated and DQ channels are isolated from supply voltage 1L+	No; DIQ channels are non-isolated and DQ channels are isolated from supply voltage 1L+	No; 8 channels are non-isolated and 8 channels are isolated from supply voltage 1L+
<b>Isolation</b>			
Isolation tested with	707 V DC (type test)	707 V DC (type test)	707 V DC (type test)
<b>Degree and class of protection</b>			
Degree of protection acc. to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	-25 °C	-25 °C	-25 °C
• max.	55 °C	55 °C	55 °C

**Technical specifications** (continued)

Article number	<b>6ES7143-5BF00-0BA0</b> ET 200AL, DIQ 4+DQ 4X24VDC/0.5A, 8XM8	<b>6ES7143-5AF00-0BA0</b> ET 200AL, DIQ 4+DQ 4X24VDC/0.5A, 4XM12	<b>6ES7143-5AH00-0BA0</b> ET 200AL, DIQ 16x24VDC/0.5A, 8xM12
<b>Connection method</b>			
Design of electrical connection for the inputs and outputs	M8, 3-pole	M12, 5-pole	M12, 5-pole
Power supply	M8, 4-pole	M8, 4-pole	M8, 4-pole
<b>ET-Connection</b>			
• ET-Connection	M8, 4-pin, shielded	M8, 4-pin, shielded	M8, 4-pin, shielded
<b>Dimensions</b>			
Width	30 mm	30 mm	45 mm
Height	159 mm	159 mm	159 mm
Depth	40 mm	40 mm	40 mm
<b>Weights</b>			
Weight, approx.	145 g	145 g	195 g

**Ordering data**

Ordering data	Article No.	Ordering data	Article No.
<b>Digital input modules</b>		<b>M8 power cable</b>	
DI 8X24VDC, 8XM8	<b>6ES7141-5BF00-0BA0</b>	4-pin	
DI 8X24VDC, 4XM12	<b>6ES7141-5AF00-0BA0</b>	Pre-assembled at both ends, M8 connector and M8 socket	
DI 16X24VDC, 8XM12	<b>6ES7141-5AH00-0BA0</b>	0.19 m	<b>6ES7194-2LH02-1AA0</b>
<b>Digital output modules</b>		0.3 m	<b>6ES7194-2LH03-1AA0</b>
DQ 8X24VDC/2A, 8XM12	<b>6ES7142-5AF00-0BA0</b>	1 m	<b>6ES7194-2LH10-1AA0</b>
<b>Digital input/output modules</b>		2 m	<b>6ES7194-2LH20-1AA0</b>
4 DIO / 4 DO, 24 V DC, 0.5 A	<b>6ES7143-5BF00-0BA0</b>	5 m	<b>6ES7194-2LH50-1AA0</b>
DIQ 4+DQ 4X24VDC/0.5A, 4XM12	<b>6ES7143-5AF00-0BA0</b>	10 m	<b>6ES7194-2LN10-1AA0</b>
DIQ 16X24VDC/0.5A, 8XM12	<b>6ES7143-5AH00-0BA0</b>	15 m	<b>6ES7194-2LN15-1AA0</b>
<b>Accessories</b>		Pre-assembled at both ends, angled M8 connector and angled M8 socket	
<b>Bus cable for backplane bus (ET connection)</b>		0.3 m	<b>6ES7194-2LH03-1AB0</b>
4-pin, shielded		1 m	<b>6ES7194-2LH10-1AB0</b>
Pre-assembled at both ends, 2 M8 connectors		2 m	<b>6ES7194-2LH20-1AB0</b>
0.19 m	<b>6ES7194-2LH02-0AA0</b>	5 m	<b>6ES7194-2LH50-1AB0</b>
0.3 m	<b>6ES7194-2LH03-0AA0</b>	10 m	<b>6ES7194-2LN10-1AB0</b>
1 m	<b>6ES7194-2LH10-0AA0</b>	15 m	<b>6ES7194-2LN15-1AB0</b>
2 m	<b>6ES7194-2LH20-0AA0</b>	Pre-assembled at one end, M8 socket	
5 m	<b>6ES7194-2LH50-0AA0</b>	2 m	<b>6ES7194-2LH20-1AC0</b>
10 m	<b>6ES7194-2LN10-0AA0</b>	5 m	<b>6ES7194-2LH50-1AC0</b>
15 m	<b>6ES7194-2LN15-0AA0</b>	10 m	<b>6ES7194-2LN10-1AC0</b>
Pre-assembled at both ends, two M8 connectors, angled		15 m	<b>6ES7194-2LN15-1AC0</b>
0.3 m	<b>6ES7194-2LH03-0AB0</b>	<b>M8 connector for ET connection</b>	<b>6ES7194-2AB00-0AA0</b>
1 m	<b>6ES7194-2LH10-0AB0</b>	4-pin, shielded	
2 m	<b>6ES7194-2LH20-0AB0</b>	<b>M8 power connector</b>	
5 m	<b>6ES7194-2LH50-0AB0</b>	Male contact insert, 4-pin	<b>6ES7194-2AA00-0AA0</b>
10 m	<b>6ES7194-2LN10-0AB0</b>	Female contact insert, 4-pin	<b>6ES7194-2AC00-0AA0</b>
15 m	<b>6ES7194-2LN15-0AB0</b>	<b>ET connection FastConnect stripping tool</b>	<b>6ES7194-2KA00-0AA0</b>
Pre-assembled at one end, one M8 connector		Stripping tool for stripping the ET connection bus cable	
2 m	<b>6ES7194-2LH20-0AC0</b>	<b>Labels</b>	<b>6ES7194-2BA00-0AA0</b>
5 m	<b>6ES7194-2LH50-0AC0</b>	10 x 5 mm, RAL 9016;	
10 m	<b>6ES7194-2LN10-0AC0</b>	5 frames with 40 labels each	
15 m	<b>6ES7194-2LN15-0AC0</b>		