

SIMATIC S7-200

Digital modules

EM 221, EM 222, EM 223

Overview



- Digital inputs/outputs to supplement the onboard I/Os of the CPUs
- For flexible adaptation of PLC to respective task
- For subsequent upgrading of the system with additional inputs and outputs

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Technical specifications EM 221

	6ES7 221-1BH22-0XA0	6ES7 221-1BF22-0XA0	6ES7 221-1EF22-0XA0
Current consumption			
from backplane bus 5 V DC, max.	70 mA	30 mA	30 mA
Power losses			
Power loss, typ.	3 W	2 W	3 W
Connection method			
Plug-in I/O terminals	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	16	8	8
m/p-reading	Yes	Yes	
Input characteristic curve acc. to IEC 1131, Type 1	Yes		Yes
Input voltage			
• Rated value, AC			230 V; 220/230 V AC (47 to 63 Hz)
• Rated value, DC	24 V	24 V	
• for signal "0"	0 to 5 V	0 to 5 V	up to 20 V AC
• for signal "1"	15 to 30 V	15 to 30 V	79 V AC or more
Input current			
• for signal "1", typ.	4 mA	4 mA	2.5 mA
Input delay (for rated value of input voltage)			
• for standard inputs			
- at "0" to "1", max.	4.5 ms	4.5 ms	15 ms
Cable length			
• Cable length, shielded, max.	500 m	500 m	500 m
• Cable length unshielded, max.	300 m	300 m	300 m
Encoder			
Connectable encoders			
• 2-wire BEROS	Yes	Yes	Yes
- permissible quiescent current (2-wire BEROS), max.	1 mA	1 mA	1 mA

Technical specifications EM 221 (continued)

	6ES7 221-1BH22-0XA0	6ES7 221-1BF22-0XA0	6ES7 221-1EF22-0XA0
Galvanic isolation			
Galvanic isolation digital inputs			
• Galvanic isolation digital inputs between the channels, in groups of	Yes; Optocoupler 4	Yes; Optocoupler 4	Yes; Optocoupler 1; (8 groups)
Dimensions and weight			
Dimensions			
• Width	71.2 mm	46 mm	71.2 mm
• Height	80 mm	80 mm	80 mm
• Depth	62 mm	62 mm	62 mm
Weight			
• Weight, approx.	160 g	150 g	160 g

Technical specifications EM 222

	6ES7 222-1BD22-0XA0	6ES7 222-1BF22-0XA0
Supply voltages		
Load voltage L+		
• Rated value (DC)	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	20.4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V
Current consumption		
from backplane bus 5 V DC, max.	40 mA	50 mA
Power losses		
Power loss, typ.	3 W	2 W
Connection method		
Plug-in I/O terminals	Yes	Yes
Digital outputs		
Number of digital outputs	4	8
Short-circuit protection	No	No; to be provided externally (see manual package "Setting up an S7-200")
Limitation of inductive shutdown voltage to	L+ (-48 V)	L+ (-48 V)
Output voltage		
• for signal "1", min.	20 V DC	20 V
Output current		
• for signal "1" permissible range for 0 to 55 °C, max.	5 A	750 mA
• for signal "0" residual current, max.	30 µA	10 µA
Parallel switching of 2 outputs		
• for increased power		Yes
Aggregate current of outputs (per group)		
• horizontal installation		
- up to 55 °C, max.	20 A	3 A
• up to 40 °C, max.	20 A	3 A
• maximum current per conductor/group	5 A	3 A
Cable length		
• Cable length, shielded, max.	500 m	500 m
• Cable length unshielded, max.	150 m	150 m

Ordering data	Order No.	Order No.
Digital input module EM 221 for CPU 221/222/224/224 XP/226 <ul style="list-style-type: none"> • 8 inputs, 24 V DC, isolated, current sourcing/sinking • 16 inputs, 24 V DC, isolated, current sourcing/sinking • 8 inputs, 120/230 V AC, isolated, current sourcing/sinking 	6ES7 221-1BF22-0XA0 6ES7 221-1BH22-0XA0 6ES7 221-1EF22-0XA0	Front flap set contains various cover flaps for CPUs and EMs; spare part Pluggable terminal block (spare part) <ul style="list-style-type: none"> • With 7 terminals (for EM 221/222) • With 12 terminals (for EM 223)
Digital output module EM 222 for CPU 221/222/224/224 XP/226 <ul style="list-style-type: none"> • 4 outputs, 24 V DC; 5A, isolated • 8 outputs, 24 V DC; 0.75 A, isolated • 4 outputs, 24 V DC, 24 to 230 V AC; 10 A, isolated, relay outputs • 8 outputs, 24 V DC, 24 to 230 V AC; 2 A, isolated, relay outputs • 8 outputs, 120/230 V AC; 0.5 A, isolated 	6ES7 222-1BD22-0XA0 6ES7 222-1BF22-0XA0 6ES7 222-1HD22-0XA0 6ES7 222-1HF22-0XA0 6ES7 222-1EF22-0XA0	SIM 274 simulator (optional) with 8 terminals for EM 221 and EM 223 S7-200 programmable controller, System Manual for CPU 221/222/224/224 XP/226 and STEP 7 Micro/Win V4 German English French Spanish Italian Chinese
Digital input/output module EM 223 for CPU 221/222/224/224 XP/226 <ul style="list-style-type: none"> • 4 inputs 24 V DC, 4 outputs 24 V DC; 0.75 A, isolated • 8 inputs, 24 V DC, 8 outputs 24 V DC; 0.75 A, isolated • 16 inputs, 24 V DC, 16 outputs 24 V DC; 0.75 A, isolated • 32 inputs, 24 V DC, 32 outputs 24 V DC; 0.75 A, isolated • 4 inputs, 24 V DC; 4 outputs, relays • 8 inputs, 24 V DC; 8 outputs, relays • 16 inputs, 24 V DC; 16 outputs, relays • 32 inputs, 24 V DC; 32 outputs, relays 	6ES7 223-1BF22-0XA0 6ES7 223-1BH22-0XA0 6ES7 223-1BL22-0XA0 6ES7 223-1BM22-0XA0 6ES7 223-1HF22-0XA0 6ES7 223-1PH22-0XA0 6ES7 223-1PL22-0XA0 6ES7 223-1PM22-0XA0	6ES7 291-3AX20-0XA0 6ES7 292-1AD20-0AA0 6ES7 292-1AE20-0AA0 6ES7 274-1XF00-0XA0 6ES7 298-8FA24-8AH0 6ES7 298-8FA24-8BH0 6ES7 298-8FA24-8CH0 6ES7 298-8FA24-8DH0 6ES7 298-8FA24-8EH0 6ES7 298-8FA24-8FH0

I: Subject to export regulations AL: N and ECCN: EAR99H