

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

6DD1607-0CA1

SIMADYN D CONTROL MODULE

Used with the applicable PLC System configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens official manufacturer documentation

SIMATIC S7-400 advanced controller

Function modules

FM 458-1 DP application module

FM 458-1 DP basic module

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Ordering data	Article No.		Article No.
FM 458-1 DP application module Basic module for computing, closed-loop control and open-loop control tasks; with PROFIBUS DP interface	6DD1607-0AA2	RS 485 bus connector with 90° cable outlet Max. transfer rate 12 Mbit/s Without PG interface With PG interface	6ES7972-0BA12-0XA0 6ES7972-0BB12-0XA0
Micro Memory Card for FM 458-1 DP basic module 2 MB 4 MB 8 MB	6ES7953-8LL31-0AA0 6ES7953-8LM31-0AA0 6ES7953-8LP31-0AA0	RS 485 bus connector with angled cable outlet Max. transfer rate 12 Mbit/s Without PG interface With PG interface	6ES7972-0BA42-0XA0 6ES7972-0BB42-0XA0
FM 458-1 DP Know-How-Protect for protection of technological application modules against unauthorized copying	6DD1607-0GA0	RS 485 bus connector with 90° cable outlet for FastConnect connection system Max. transfer rate 12 Mbit/s Without PG interface • 1 unit • 100 units With PG interface • 1 unit • 100 units	6ES7972-0BA52-0XA0 6ES7972-0BA52-0XB0 6ES7972-0BB52-0XA0 6ES7972-0BB52-0XB0
SC 64 interface cable To connect FM 458-1 to the serial port of a programming device/ PC	6DD1684-0GE0	PROFIBUS FastConnect bus cable Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m Preferred lengths: 20 m 50 m 100 m	6XV1830-0EH10 6XV1830-0EN20 6XV1830-0EN50 6XV1830-0ET10
SB10 interface module To connect 8 binary I/Os to FM 458-1 DP	6DD1681-0AE2		
SB61 interface module To connect 8 binary I/Os to FM 458-1 DP, input voltage: 24/48 V DC	6DD1681-0EB3		
SU12 interface module To connect 10 signals to FM 458-1 DP	6DD1681-0AJ1		

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Function modules

FM 458-1 DP application module

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EXM 438-1 input/output expansion**Overview**

- Optional plug-in expansion module for the FM 458-1 DP basic module
- For input and output of time-critical signals
- With digital and analog inputs/outputs
- Incremental and absolute value encoders can be connected
- 4 high-resolution analog outputs
- Fan-free operation up to 40°C

Technical specifications

Article number	6DD1607-0CA1 EXM 438-1 I/O EXPANSION
Product type designation	
Supply voltage	
Rated value (DC)	
• 5 V DC	Yes
• 24 V DC	Yes; to be set up externally
Input current	
Current consumption, typ.	1.5 A
Encoder supply	
Output voltage	about 14 V (non-isolated)
short-circuit protection	Yes; Electronic
Output current	
• Rated value	100 mA
Hardware configuration	
Slots	
• Required slots	1
Digital inputs	
Number of digital inputs	16
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-1 to +6 V or input open
• for signal "1"	+13 to +33 V
Input current	
• for signal "0", max. (permissible quiescent current)	0 mA
• for signal "1", typ.	3 mA
Input delay (for rated value of input voltage) for standard inputs	
- at "0" to "1", max.	200 µs
Digital outputs	
Number of digital outputs	8
short-circuit protection	Yes; electronic/thermal
• Response threshold, typ.	250 mA
Limitation of inductive shutdown voltage to	Supply voltage +1 V

Article number	6DD1607-0CA1 EXM 438-1 I/O EXPANSION
Output voltage	
• for signal "0", max.	3 V
• for signal "1", max.	Supply voltage -2.5 V
Output current	
• for signal "1" rated value	50 mA
• for signal "1" permissible range for 0 to 40 °C, min.	100 mA
• for signal "0" residual current, max.	20 µA
• Total switching current	80 % at 50 °C all outputs 50 mA
Output delay with resistive load	
• "0" to "1", max.	15 µs
Analog inputs	
Number of analog inputs	5; Differential inputs
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes; -10 V: +/-4 LSB; to +10 V: +/-4 LSB (1 LSB = 4.88 mV)
• Input resistance (-10 V to +10 V)	470 kΩ
Analog outputs	
Number of analog outputs	8; 4 outputs 16 bit; 4 outputs 12 bit
Voltage output, short-circuit protection	Yes; relative to frame
Voltage output, short-circuit current, max.	16 bits: 27 mA; 12 bits: 100 mA
Output ranges, voltage	
• -10 to +10 V	Yes
Analog value creation	
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	4 AO: 16 bits, 4 AO: 12 bits, 5 AI: 12 bits
• Conversion time (per channel)	4 AO (16 bits): 2 µs; 4 AO (12 bits): 4 µs; 5 AI: 45 µs
Encoder	
Number of connectable encoders, max.	12; 8 incremental encoders (synchronizable), 4 absolute encoders

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Function modules

FM 458-1 DP application module

EXM 438-1 input/output expansion

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Technical specifications (continued)

Article number	6DD1607-OCA1 EXM 438-1 I/O EXPANSION
Connectable encoders	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes; Single or multturn encoder with SSI (synchronous serial) or EnDat interface
Encoder signals, incremental encoder (symmetrical)	
• Trace mark signals	1) for tracks A and B (90° out of phase), poss. with zero pulse N; 2) for separate forward and backward track
• Input signal	With 0 signal: -5 to 0 V; with 1 signal: +3 to +5 V; permissible input voltage range: differential voltage -5 to +5 V; max. input current: 15 mA (important: not limited on module side!)
Encoder signals, incremental encoder (asymmetrical)	
• Trace mark signals	Track A and B (phase-shifted by 90 degrees), possibly with zero pulse N
• Input voltage	with 0 signal: -30 to +4 V (at 15 mA load); with 1 signal: +8 to 30 V (at 15 mA load); permissible input voltage range: differential voltage -30 to +30 V
Encoder signals, absolute encoder (SSI)	
• Input signal	5 V acc. to RS 422
• Data signal	Dual-, Gray-, Gray-Excess-Code
• Clock frequency, max.	2 MHz; 100 kHz to 2 MHz (depending on cable length)
Errors/accuracies	
Linearity error (relative to output range), (+/-)	(+/- 1 LSB)
Galvanic isolation	
Galvanic isolation digital inputs	
• Galvanic isolation digital inputs	No
Galvanic isolation digital outputs	
• Galvanic isolation digital outputs	No
Galvanic isolation analog inputs	
• Galvanic isolation analog inputs	No
Galvanic isolation analog outputs	
• Galvanic isolation analog outputs	No
Weights	
Weight, approx.	1 kg

Ordering data**Article No.****EXM 438-1 input/output expansion**

for direct exchange of digital and analog signals between FM 458-1 DP and the plant

6DD1607-OCA1**SB10 interface module**

To connect 8 binary inputs or outputs to FM 458-1 DP

6DD1681-OAE2**SB61 interface module**

To connect 8 binary inputs to FM 458-1 DP, input voltage: 24/48 V DC

6DD1681-0EB3**SB71 interface module**

To connect 8 binary outputs to FM 458-1 DP, output voltage: 24/48 V DC

6DD1681-0DH1**SU12 interface module**

To connect 10 signals to FM 458-1 DP

6DD1681-0AJ1**SU13 interface module**

To connect 50 signals to FM 458-1 DP

6DD1681-0GK0**SC 62 interface cable**

To connect EXM 438-1 with up to 5 SBxx or SU12

6DD1684-0GC0**SC 63 interface cable**

To connect EXM 438-1 with an SU13

6DD1684-0GD0

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FM 458-1 DP application module

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EXM 448 universal communications expansion module**Overview**

- Optional expansion module for the FM 458-1 DP basic module
- For fast communication over PROFIBUS DP or SIMOLINK
- EXM 448: With vacant slot for a MASTERDRIVES option module

Technical specifications

Article number	6DD1607-0EA0 S7-400, EXM 448 F. FM458
Product type designation	
Supply voltage	
Rated value (DC)	
• 5 V DC	Yes
Hardware configuration	
Slots	
• Required slots	1
Weights	
Weight, approx.	0.8 kg

Ordering data**Article No.****EXM 448 universal communications expansion module****6DD1607-0EA0**

For fast communication, for example, with drives; with free slot for MASTERDRIVES option module

EXM 448-2 universal communications expansion module**Overview**

- Optional plug-in expansion module for the FM 458-1 DP basic module
- For high-speed communication over up to 2 SIMOLINK interfaces
- For coupling several FM 458-1 DP application modules in synchronism with the sampling time

Technical specifications

Article number	6DD1607-0EA2 SIMATIC S7-400 EXM 448-2 COMM.-EXPANS.
Product type designation	
Supply voltage	
Rated value (DC)	
• 5 V DC	Yes
Hardware configuration	
Slots	
• Required slots	1
Weights	
Weight, approx.	0.9 kg

Ordering data**Article No.****EXM 448-2 universal communications expansion****6DD1607-0EA2**

For high-speed communication with drives; for establishing two SIMOLINK fiber optic connections