



SIMATIC S7-1200 G2, digital I/O, SM 1226, F-DI 4x / F-DQ 2x 2A PPM / DI 2x, 24 V DC, up to PL e (ISO 13849-1) / SIL3 (IEC 61508)

General information	
Product type designation	SM 1226, F-DI 4x 24 V DC, F-DQ 2x 24 V DC, DI 2x 24 V DC
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Input current	
from backplane bus 5 V DC, max.	80 mA
Digital inputs	
<ul style="list-style-type: none"> <li>from load voltage L+ (without load), max.</li> </ul>	42 mA; 1L+ plus 6 mA / input used plus any VS0 to VS3 current used
Digital outputs	
<ul style="list-style-type: none"> <li>from load voltage L+, max.</li> </ul>	45 mA; 2L+ plus load current for all P-switch outputs
Encoder supply	
Number of outputs	4; Vs0 - Vs3
24 V encoder supply	
<ul style="list-style-type: none"> <li>Short-circuit protection</li> <li>Output current, max.</li> </ul>	Yes; per channel, electronic 0.5 A; per sensor supply; 1.0 A total sensor supplies
Power loss	
Power loss, typ.	6 W
Digital inputs	
Number of digital inputs	6; 4 fail-safe inputs: 2 (1oo2), 4 (1oo1), or a mix; 2 standard inputs
<ul style="list-style-type: none"> <li>in groups of</li> </ul>	6
Sourcing/sinking input	No
Input characteristic curve in accordance with IEC 61131, type 1	Yes; Current-sinking
Input voltage	
<ul style="list-style-type: none"> <li>Rated value (DC)</li> <li>for signal "0"</li> <li>for signal "1"</li> </ul>	24 V -3 to +5V +15 to +30 V
Input current	
<ul style="list-style-type: none"> <li>for signal "0", max. (permissible quiescent current)</li> <li>for signal "1", min.</li> <li>for signal "1", typ.</li> </ul>	0.5 mA 2.5 mA 4 mA; 6 mA maximum
Input delay (for rated value of input voltage)	
for standard inputs	
— parameterizable	Yes; Fail-safe: 0.8 / 1.6 / 3.2 / 6.4 / and 12.8 ms (selectable individually) Standard: 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / and 12.8 ms (selectable together)
Cable length	
<ul style="list-style-type: none"> <li>shielded, max.</li> </ul>	500 m

<ul style="list-style-type: none"> <li>• unshielded, max.</li> </ul>	300 m
<b>Digital outputs</b>	
Number of digital outputs	2
<ul style="list-style-type: none"> <li>• in groups of</li> </ul>	2
Short-circuit protection	Yes; per channel, electronic
<ul style="list-style-type: none"> <li>• Response threshold, typ.</li> </ul>	10 A
Open-circuit detection	Yes; per channel, only detects when output is off with PM load that allows small negative current
Overload protection	Yes; per channel
<ul style="list-style-type: none"> <li>• Response threshold, typ.</li> </ul>	4 A; measured at P-switch for more than 0.5 s
Limitation of inductive shutdown voltage to	Typ. -74 V (typ. -26 V P-switch; typ. +48 V M-switch)
Controlling a digital input	Yes; Only permitted in PP mode, not with PM mode
<b>Switching capacity of the outputs</b>	
<ul style="list-style-type: none"> <li>• on lamp load, max.</li> </ul>	10 W
<b>Output voltage</b>	
<ul style="list-style-type: none"> <li>• Rated value (DC)</li> </ul>	24 V
<ul style="list-style-type: none"> <li>• for signal "1", min.</li> </ul>	2L+ (-2.0 V); P-switch: 2L+ (-1.5 V); M-switch: 0.5 V
<b>Output current</b>	
<ul style="list-style-type: none"> <li>• for signal "1" rated value</li> </ul>	2 A
<ul style="list-style-type: none"> <li>• for signal "1" permissible range, max.</li> </ul>	10 mA to 2 A; 4 A total for all outputs
<ul style="list-style-type: none"> <li>• for signal "0" residual current, max.</li> </ul>	0.5 mA; P-switch or M-switch
<b>Parallel switching of two outputs</b>	
<ul style="list-style-type: none"> <li>• for uprating</li> </ul>	No
<ul style="list-style-type: none"> <li>• for redundant control of a load</li> </ul>	No
<b>Switching frequency</b>	
<ul style="list-style-type: none"> <li>• with resistive load, max.</li> </ul>	30 Hz
<ul style="list-style-type: none"> <li>• with inductive load, max.</li> </ul>	0.1 Hz
<ul style="list-style-type: none"> <li>• on lamp load, max.</li> </ul>	10 Hz
<b>Cable length</b>	
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	500 m
<ul style="list-style-type: none"> <li>• unshielded, max.</li> </ul>	30 m for hardware version FS-01; 10 m for hardware revision FS-01 when used in burner applications related to EN 298
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes; available for the module and failsafe I/O only; not supported for standard inputs
<b>Diagnostics indication LED</b>	
<ul style="list-style-type: none"> <li>• DIAG LED</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• for status of the inputs</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• for status of the outputs</li> </ul>	Yes
<b>Potential separation</b>	
<b>Potential separation digital inputs</b>	
<ul style="list-style-type: none"> <li>• between the channels</li> </ul>	No
<ul style="list-style-type: none"> <li>• Number of potential groups</li> </ul>	1
<ul style="list-style-type: none"> <li>• between the channels and backplane bus</li> </ul>	Yes
<b>Potential separation digital outputs</b>	
<ul style="list-style-type: none"> <li>• between the channels</li> </ul>	No
<ul style="list-style-type: none"> <li>• between the channels and backplane bus</li> </ul>	Yes
<b>Isolation</b>	
Isolation tested with	707 V DC (type test)
<b>Degree and class of protection</b>	
IP degree of protection	IP20
<b>Standards, approvals, certificates</b>	
Siemens Eco Profile (SEP)	Siemens EcoTech
CE mark	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
<b>Highest safety class achievable in safety mode</b>	
<ul style="list-style-type: none"> <li>• Performance level according to ISO 13849-1</li> </ul>	PLd (F-DI single-channel, F-DQ with Dark test disabled), PLe (F-DI two-channel, F-DQ including Dark test disabled for 48 hours)

<ul style="list-style-type: none"> <li>• Category according to ISO 13849-1</li> <li>• SIL acc. to IEC 61508</li> </ul>	<p>Cat. 3 (F-DI single-channel, F-DQ with Dark test disabled), Cat. 4 (F-DI two-channel, F-DQ including Dark test disabled for 48 hours)</p> <p>SIL 2 (F-DI single-channel, F-DQ with Dark test disabled), SIL 3 (F-DI two-channel, F-DQ including Dark test disabled for 48 hours)</p>
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b>	
— Low demand mode: PFDavg in accordance with SIL2	< 2.00E-04 F-DI; < 2.00E-04 F-DQ
— Low demand mode: PFDavg in accordance with SIL3	< 3.00E-05 F-DI; < 3.00E-05 F-DQ
— High demand/continuous mode: PFH in accordance with SIL2	< 5.00E-09 1/h F-DI; < 6.00E-09 1/h F-DQ
— High demand/continuous mode: PFH in accordance with SIL3	< 5.00E-10 1/h F-DI; < 5.00E-09 1/h F-DQ

**Ambient conditions**

**Free fall**

• Fall height, max.	0.3 m; five times, in product package
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**Ambient temperature during operation**

• horizontal installation, min.	0 °C; No condensation
• horizontal installation, max.	60 °C; at max. specification
• vertical installation, min.	0 °C; No condensation
• vertical installation, max.	50 °C; at max. specification

**Ambient temperature during storage/transportation**

• min.	-40 °C
• max.	70 °C

**Air pressure acc. to IEC 60068-2-13**

• Operation, min.	540 hPa
• Operation, max.	1 140 hPa
• Storage/transport, min.	540 hPa
• Storage/transport, max.	1 140 hPa

**Altitude during operation relating to sea level**

• Installation altitude, min.	-1 000 m
• Installation altitude, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	For altitudes above 2 000 m, the maximum permissible ambient temperature must be derated: >2 000 m 0.9 factor, >3 000 m 0.8 factor, >4 000 m 0.7 factor. 5 000 m is max allowed altitude.

**Relative humidity**

• Operation at 25 °C without condensation, max.	95 %
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**Mechanics/material**

Enclosure material (front)	
• Plastic	Yes

**Dimensions**

Width	30 mm
Height	125 mm
Depth	100 mm

**Weights**

Weight, approx.	180 g
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**Classifications**

	Version	Classification
eClass	14	27-24-22-04
eClass	12	27-24-22-04
eClass	9.1	27-24-22-04
eClass	9	27-24-22-04
eClass	8	27-24-22-04
eClass	7.1	27-24-22-04
eClass	6	27-24-22-04
ETIM	10	EC001419
ETIM	9	EC001419
ETIM	8	EC001419
ETIM	7	EC001419

Approvals / Certificates

General Product Approval	For use in hazardous locations	Functional Safety
<a href="#">Miscellaneous</a>	 UL	 <a href="#">China RoHS</a> <a href="#">CCC-Ex</a> <a href="#">TUEV</a>

last modified:

4/20/2026 