## Data sheet



SIPLUS S7-1200 SM 1226 F-DI 16x24 V DC -25...+55°C with conformal coating based on 6ES7226-6BA32-0XB0 F-DI 16X 24 V DC, PROFIsafe, 70 mm overall width, up to PL E (ISO 13849-1)/ SIL3 (IEC 61508)

General information	
Product type designation	SM 1226, F-DI 16x24 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
Input current	
from backplane bus 5 V DC, max.	155 mA; Current consumption (SM Bus, 5 V DC): 155 mA
Digital inputs	
• from load voltage L+ (without load), max.	130 mA; 130 mA + 6 mA / input used + any Vs1/Vs2 current used
Power loss	
Power loss, typ.	7 W
Digital inputs	
Number of digital inputs	16; 16 (1001) or 8 (1002); Note: You can individually assign each pair of inputs "a.x" and "b.x" as a single (1002)-channel or as 2 separate (1001)-channels
Number of simultaneously controllable inputs	
horizontal installation	

vertical installation  — up to 40 °C, max.  Input voltage  • for signal "0" • for signal "1"  Input current • for signal "0", max. (permissible quiescent current)  Input delay (for rated value of input voltage)  for standard inputs  — parameterizable  • shielded, max.  200 m; Unshielded with input filter time of 1.6 ms to 12.6 ms (With an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  • unshielded, max.  200 m; Unshielded with input filter time of 0.8 ms to 12.6 s (With an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  Interrupts/diagnostics/status information  Diagnostics indication LED • for status of the inputs  Pegree and class of protection  IP degree of protection  IP degree of protection  IP degree of protection  Standards, approvals, certificates  Highest safety class achievable in safety mode  • Performance level according to ISO 13849-1 • St.l. acc. to IEC 61508  Ambient conditions  Free fall • Fall height, max.  Ambient temperature during operation  • min. • max. • permissible temperature change  Altitude during operation relating to sea level • Installation altitude above sea level, max.  2000 m  165, 16 inputs at 45 °C vertical  15 V DC to 55 °C, 3 °C / minute  167, 18 in put 45 °C, 2000 N  17 conditions  18 in put 45 °C, 2000 N  18 in put 41 °C, 2000 N  19 in put 41 °C, 2000 N  10 i	— up to 50 °C, max.	16; 16 inputs at 55 °C horizontal
Input voltage  • for signal "0" • for signal "1"  Input current • for signal "0", max. (permissible quiescent current)  Input delay (for rated value of input voltage) • shielded, max.  • shielded, max.  200 m; Unshielded with input filter time of 1.8 ms to 12.6 ms (With an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  • unshielded, max.  200 m; Shielded with input filter time of 0.8 ms to 12.6 s (With an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  Interrupts/diagnostics/status information  Diagnostics indication LED • for status of the inputs  Yes  Degree and class of protection  IP degree of protection  IP degree of protection  IP degree of protection  IP degree of protection  IP20  Standards, approvals, certificates  Highest safety class achievable in safety mode  • Performance level according to ISO 13849-1 • SIL acc. to IEC 61508  Ambient conditions  Free fall  • Fall height, max.  Ambient conditions  Free fall  • Fall height, max.  70 °C  Altitude during operation relating to sea level	vertical installation	
for signal "0"   -30 V DC to +5 V DC     for signal "1"   15 V DC to 30 V DC     for signal "0", max. (permissible quiescent current)   0.5 mA     for signal "0", max. (permissible quiescent current)   0.5 mA     for signal "0", max. (permissible quiescent current)   0.5 mA     for signal "0", max. (permissible quiescent current)   0.5 mA     for standard inputs   - parameterizable   Yes; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms     Cable length   200 m; Unshielded with input filter time of 1.6 ms to 12.6 ms (With an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)	— up to 40 °C, max.	16; 16 inputs at 45 °C vertical
• for signal "1" • for signal "0", max. (permissible quiescent current)  Input delay (for rated value of input voltage)  for standard inputs  — parameterizable  Cable length  • shielded, max.  200 m; Unshielded with input filter time of 1.6 ms to 12.6 ms (With an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  • unshielded, max.  200 m; Unshielded with input filter time of 1.6 ms to 12.6 ms (With an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  Interrupts/diagnostics/status information  Diagnostics indication LED  • for status of the inputs  Pegree and class of protection  IP degree of	Input voltage	
Input current  • for signal "0", max. (permissible quiescent current)  Input delay (for rated value of input voltage)  for standard inputs  — parameterizable  Ves; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms  Cable length  • shielded, max.  200 m; Unshielded with input filter time of 1.6 ms to 12.6 ms (With an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  • unshielded, max.  200 m; Shielded with input filter time of 0.8 ms to 12.6 s (With an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  Interrupts/diagnostics/status information  Diagnostics indication LED  • for status of the inputs  Ves  Degree and class of protection  IP degree of protection	• for signal "0"	-30 V DC to +5 V DC
for signal "0", max. (permissible quiescent current)   Input delay (for rated value of input voltage)   for standard inputs	• for signal "1"	15 V DC to 30 V DC
current)  Input delay (for rated value of input voltage)  for standard inputs  — parameterizable  * shielded, max.  * shielded, max.  * unshielded, with input filter time of 1.6 ms to 12.6 ms (With an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  * unshielded, max.  * unshielded, with input filter time of 1.6 ms to 12.6 ms (With an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  * unshielded, max.	Input current	
for standard inputs  — parameterizable  Stable length  • shielded, max.  • unshielded, max.  • parameterizable  • for status of the inputs  Pegree and class of protection  IP degree of protection	- "	0.5 mA
— parameterizable Yes; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms  Cable length  ■ shielded, max.  200 m; Unshielded with input filter time of 1.6 ms to 12.6 ms (With an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  ■ unshielded, max.  200 m; Shielded with input filter time of 0.8 ms to 12.6 s (With an input delay of 0.8 ms, shielded cables must be used for the digital input and the sensor supply)  Interrupts/diagnostics/status information  Diagnostics indication LED  ■ for status of the inputs  Pegree and class of protection  IP degree of protection degree of protection degree of protection degr	Input delay (for rated value of input voltage)	
Cable length  • shielded, max.  an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  • unshielded, max.  200 m; Unshielded with input filter time of 1.6 ms to 12.6 ms (With an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  Interrupts/diagnostics/status information  Diagnostics indication LED  • for status of the inputs  Pegree and class of protection  IP degree of protection  IP20  Standards, approvals, certificates  Highest safety class achievable in safety mode  • Performance level according to ISO 13849-1  • SIL acc. to IEC 61508  Ambient conditions  Free fall  • Fall height, max.  Ambient temperature during operation  • min.  • max.  • permissible temperature change  Ambient temperature during storage/transportation  • min.  • max.  • permissible temperature during storage/transportation  • min.  • max.  • permissible temperature during to sea level	for standard inputs	
* shielded, max.  200 m; Unshielded with input filter time of 1.6 ms to 12.6 ms (With an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  • unshielded, max.  200 m; Shielded with input filter time of 0.8 ms to 12.6 s (With an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  Interrupts/diagnostics/status information  Diagnostics indication LED  • for status of the inputs  Pegree and class of protection  IP degree of protection  IP20  Standards, approvals, certificates  Highest safety class achievable in safety mode  • Performance level according to ISO 13849-1  • SIL acc. to IEC 61508  Ambient conditions  Free fall  • Fall height, max.  Ambient temperature during operation  • min.  • max.  • permissible temperature change  Ambient temperature during storage/transportation  • min.  • max.  • permissible temperature during storage/transportation  • min.  • max.  • permissible temperature during storage/transportation  • min.  • max.  • permissible temperature during storage/transportation  • min.  • max.  Adv °C  - max.  Altitude during operation relating to sea level	— parameterizable	Yes; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms
an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  • unshielded, max.  200 m; Shielded with input filter time of 0.8 ms to 12.6 s (With an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  Interrupts/diagnostics/status information  Diagnostics indication LED  • for status of the inputs  Yes  Degree and class of protection  IP degree of protection  IP degree of protection  IP 20  Standards, approvals, certificates  Highest safety class achievable in safety mode  • Performance level according to ISO 13849-1  • SIL acc. to IEC 61508  SIL 2 (single-channel), SIL 3 (two-channel)  Ambient conditions  Free fall  • Fall height, max.  Ambient temperature during operation  • min.  • max.  • permissible temperature change  Ambient temperature during storage/transportation  • min.  • max.  • permissible temperature change  Ambient temperature during storage/transportation  • min.  • max.  • permissible temperature change  Ambient temperature during storage/transportation  • min.  • max.  Ado °C  To °C  Altitude during operation relating to sea level	Cable length	
Diagnostics indication LED  ● for status of the inputs  Pegree and class of protection  IP degree of protection  IP20  Standards, approvals, certificates  Highest safety class achievable in safety mode  ● Performance level according to ISO 13849-1  ● SIL acc. to IEC 61508  Ambient conditions  Free fall  ● Fall height, max.  Ambient temperature during operation  ● min.  ● max.  ● permissible temperature change  Ambient temperature during storage/transportation  ● min.  ● max.  Altitude during operation relating to sea level		an input delay of 0.8 ms, shielded cables must be used for the digital inputs and the sensor supply)  200 m; Shielded with input filter time of 0.8 ms to 12.6 s (With an input delay of 0.8 ms, shielded cables must be used for the digital
for status of the inputs      Degree and class of protection  IP degree of protection  IP20  Standards, approvals, certificates  Highest safety class achievable in safety mode      Performance level according to ISO 13849-1     SIL acc. to IEC 61508  Ambient conditions  Free fall     Pall height, max.  Ambient temperature during operation      min.     max.     permissible temperature change  Ambient temperature during storage/transportation      min.     -25 °C; = Tmin     55°C; = Tmax     55°C; = Tmax     70°C  Altitude during operation relating to sea level	Interrupts/diagnostics/status information	
Degree and class of protection  IP degree of protection  IP20  Standards, approvals, certificates  Highest safety class achievable in safety mode  • Performance level according to ISO 13849-1 • SIL acc. to IEC 61508  Ambient conditions  Free fall  • Fall height, max.  • Parminsible temperature during operation  • min. • max. • permissible temperature change  Ambient temperature during storage/transportation  • min. • max. • permissible temperature during storage/transportation  • min. • max.  Ambient temperature during storage/transportation  • min. • max.  Ambient temperature during storage/transportation  • min. • max.  Autitude during operation relating to sea level	Diagnostics indication LED	
IP degree of protection  Standards, approvals, certificates  Highest safety class achievable in safety mode  • Performance level according to ISO 13849-1 • SIL acc. to IEC 61508  Ambient conditions  Free fall  • Fall height, max.  Ambient temperature during operation  • min.  • max.  • permissible temperature change  Ambient temperature during storage/transportation  • min.  • max.  • permissible temperature during storage/transportation  • min.  • max.  • permissible temperature during storage/transportation  • min.  • max.  Ambient temperature during storage/transportation  • min.  • max.  Altitude during operation relating to sea level	<ul><li>for status of the inputs</li></ul>	Yes
IP degree of protection  Standards, approvals, certificates  Highest safety class achievable in safety mode  • Performance level according to ISO 13849-1 • SIL acc. to IEC 61508  Ambient conditions  Free fall  • Fall height, max.  Ambient temperature during operation  • min.  • max.  • permissible temperature change  Ambient temperature during storage/transportation  • min.  • max.  • permissible temperature during storage/transportation  • min.  • max.  • permissible temperature during storage/transportation  • min.  • max.  Ambient temperature during storage/transportation  • min.  • max.  Altitude during operation relating to sea level	Degree and class of protection	
Highest safety class achievable in safety mode  • Performance level according to ISO 13849-1 • SIL acc. to IEC 61508  Ambient conditions  Free fall • Fall height, max.  • min. • max. • permissible temperature change  Ambient temperature during storage/transportation • min. • max. • permissible temperature during storage/transportation • min. • max. • max. • permissible temperature during storage/transportation • min. • max. • max. • Max. • Max. • Max. • Permissible temperature during storage/transportation • min. • max. •		IP20
Highest safety class achievable in safety mode  • Performance level according to ISO 13849-1 • SIL acc. to IEC 61508  Ambient conditions  Free fall • Fall height, max.  • min. • max. • permissible temperature change  Ambient temperature during storage/transportation • min. • max. • permissible temperature during storage/transportation • min. • max. • max. • permissible temperature during storage/transportation • min. • max. • max. • Max. • Max. • Max. • Permissible temperature during storage/transportation • min. • max. •	Standards, approvals, certificates	
SIL 2 (single-channel), SIL 3 (two-channel)  Ambient conditions  Free fall  Fall height, max.  O.3 m; five times, in product package  Ambient temperature during operation  min.  max.  permissible temperature change  Ambient temperature during storage/transportation  min.  min.  max.  Ambient temperature during storage/transportation  min.  min.  max.  Altitude during operation relating to sea level		
Ambient conditions  Free fall  Free fall  Fall height, max.  O.3 m; five times, in product package  Ambient temperature during operation  min.  max.  permissible temperature change  For to 55°C, 3°C / minute  Ambient temperature during storage/transportation  min.  max.  Altitude during operation relating to sea level	Performance level according to ISO 13849-1	1-channel, Category 3, PL d; 2-channel, Category 3 or 4, PL e
Free fall  • Fall height, max.  0.3 m; five times, in product package  Ambient temperature during operation  • min.  • max.  • permissible temperature change  Ambient temperature during storage/transportation  • min.  • max.  Altitude during operation relating to sea level	• SIL acc. to IEC 61508	SIL 2 (single-channel), SIL 3 (two-channel)
Free fall  • Fall height, max.  0.3 m; five times, in product package  Ambient temperature during operation  • min.  • max.  • permissible temperature change  Ambient temperature during storage/transportation  • min.  • max.  Altitude during operation relating to sea level	Ambient conditions	
Ambient temperature during operation  • min.  • max.  • permissible temperature change  Ambient temperature during storage/transportation  • min.  • max.  -40 °C  • max.  Altitude during operation relating to sea level		
<ul> <li>min.</li> <li>max.</li> <li>permissible temperature change</li> <li>5°C to 55°C, 3°C / minute</li> </ul> Ambient temperature during storage/transportation <ul> <li>min.</li> <li>max.</li> </ul> -40 °C <ul> <li>max.</li> </ul> Altitude during operation relating to sea level	• Fall height, max.	0.3 m; five times, in product package
<ul> <li>max.</li> <li>permissible temperature change</li> <li>5°C to 55°C, 3°C / minute</li> </ul> Ambient temperature during storage/transportation <ul> <li>min.</li> <li>-40 °C</li> <li>max.</li> <li>70 °C</li> </ul> Altitude during operation relating to sea level	Ambient temperature during operation	
<ul> <li>permissible temperature change</li> <li>5°C to 55°C, 3°C / minute</li> <li>Ambient temperature during storage/transportation</li> <li>min.</li> <li>-40 °C</li> <li>max.</li> <li>70 °C</li> <li>Altitude during operation relating to sea level</li> </ul>	• min.	-25 °C; = Tmin
Ambient temperature during storage/transportation  • min.	• max.	55 °C; = Tmax
<ul> <li>min.</li> <li>-40 °C</li> <li>max.</li> <li>70 °C</li> </ul> Altitude during operation relating to sea level	• permissible temperature change	5°C to 55°C, 3°C / minute
• max. 70 °C  Altitude during operation relating to sea level	Ambient temperature during storage/transportation	
Altitude during operation relating to sea level	• min.	-40 °C
	• max.	70 °C
Installation altitude above sea level, max.     2 000 m	Altitude during operation relating to sea level	

With condensation, tested in accordance with IEC 60068-2-38, max.	100% 2011
	400 0/ DIII: 1
	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes
Use in stationary industrial systems	
<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
— to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology	
<ul> <li>Against chemically active substances acc. to EN 60654-4</li> </ul>	Yes; Class 3 (excluding trichlorethylene)
<ul> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life
<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Conformal coating, Class A
echanics/material	

• Plastic	Yes	
Dimensions		
Width	70 mm	
Height	100 mm	
Depth	75 mm	
Weights		
Weight, approx.	250 g	
last modified:	08/30/2019	