

SIPLUS S7-1200 SM 1232 T1 RAIL -25 ... +55°C T1 with 70°C for 10 min with conformal coating based on 6ES7232-4HD32-0XB0. S7-1200, Analog output, SM 1232, 4 AO, +/-10 V, 14-bit resolution: or 0-20 mA, 13-bit resolution:



General information	
Product type designation	SM 1232, AQ 4x14 bit
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	45 mA
from backplane bus 5 V DC, typ.	80 mA
Power loss	
Power loss, typ.	1.5 W
Analog outputs	
Number of analog outputs	4; Current or voltage
Output ranges, voltage	
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 000 Ω

- with current outputs, max.

600 Ω

## Analog value generation for the outputs

### Integration and conversion time/resolution per channel

- Resolution (incl. overrange)

Voltage: 14 bit; Current : 13 bit

## Errors/accuracies

Temperature error (relative to output range), (+/-)

25 °C ±0.3%, to 55 °C ±0.6% total measurement range

Basic error limit (operational limit at 25 °C)

- Voltage, relative to output range, (+/-)
- Current, relative to output range, (+/-)

0.3 %

0.3 %

Interference voltage suppression for  $f = n \times (f_1 \pm 1 \%)$ ,  $f_1$  = interference frequency

- Common mode voltage, max.

12 V

## Interrupts/diagnostics/status information

Alarms

Yes

Diagnostics function

Yes

Alarms

- Diagnostic alarm

Yes

Diagnoses

- Monitoring the supply voltage
- Wire-break
- Short-circuit

Yes

Yes

Yes

Diagnostics indication LED

- for status of the outputs
- for maintenance

Yes

Yes

## Degree and class of protection

IP degree of protection

IP20

## Standards, approvals, certificates

Railway application

- EN 50121-3-2
- EN 50121-4
- EN 50124-1

Yes; EMC for rail vehicles

Yes; EMC for signal and telecommunications systems

Yes; Railway applications - overvoltage category OV2; pollution degree PD2; rated surge voltage  $UN_i = 0.5 \text{ kV}$ ;  $UN_m = 24 \text{ V DC}$

- EN 50125-1
- EN 50125-2
- EN 50125-3

Yes; Rail vehicles - see ambient conditions

Yes; Stationary electrical equipment - see ambient conditions

Yes; Signal and telecommunications systems - see ambient conditions; vibrations and shocks: Application point outside of tracks (1 m to 3 m away from track)

- EN 50155

Yes; Rail vehicles - temperature class T1, horizontal mounting position, salt spray Class ST2

- EN 61373

Yes; Rail vehicles - vibrations and shocks: Category 1 Class A/B

- Fire protection acc. to EN 45545-2

Yes; Rail vehicles - verification on request

<b>Ambient conditions</b>	
<b>Free fall</b>	
• Fall height, max.	0.3 m; five times, in product package
<b>Ambient temperature during operation</b>	
• min.	-25 °C; = Tmin (incl. condensation/frost)
• max.	60 °C; = Tmax; +70 °C for 10 minutes (T1 acc. to EN 50155) for horizontal mounting position
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>	
• Operation at 25 °C without condensation, max.	95 %
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
— Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
— to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
— to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>	
— to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
— to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
— to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
— Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)

— Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	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)
<b>Remark</b>	
— Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
<ul style="list-style-type: none"> <li>• Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>• Protection against fouling acc. to EN 60664-3</li> <li>• Electronic equipment on rolling stock acc. to EN 50155</li> <li>• Military testing according to MIL-I-46058C, Amendment 7</li> <li>• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	<p>Yes; Class 2 for high reliability</p> <p>Yes; Type 1 protection</p> <p>Yes; Class PC2 protective coating acc. to EN 50155:2017</p> <p>Yes; Discoloration of coating possible during service life</p> <p>Yes; Conformal coating, Class A</p>
<b>Connection method</b>	
required front connector	Yes
<b>Mechanics/material</b>	
Enclosure material (front)	
<ul style="list-style-type: none"> <li>• Plastic</li> </ul>	Yes
<b>Dimensions</b>	
Width	45 mm
Height	100 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	180 g
<b>Other</b>	
Note:	for use in railway applications, also observe the product information "SIPLUS extreme RAIL" A5E37661960A, Online Support article 109736776
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