



SIMATIC S7-300, Analog input SM 331, isolated, 8 AI thermocouples Type B, E, J, K, L, N, R, S, T TXK/TXK (L) according to GOST 16 bit, 50ms, 1x 40-pole

Figure similar

General information	
Product function	
Protection function	
Engineering with	
Integrated drive control	
Operating mode	
Operator control and monitoring	
Process images	
User administration	
Alarms	
Recipes/user archives	
Display	
Line display	
Resolution (pixels)	
Control elements	
Input device	
Keyboard fonts	
Touch operation	
Connection type	
Special operator controls	
Frame size/design	
Ergonomics	
Supply voltage	
Line frequency	
Mains filter	
Mains buffering	
Load voltage L+	
<ul style="list-style-type: none"> <li>Rated value (DC)</li> <li>Reverse polarity protection</li> </ul>	24 V Yes
Load voltage 1L+	
Load voltage 2L+	
Load voltage L1	
Auxiliary voltage 1L+, load voltage 2L+	
Input voltage	
Input voltage acc. to VDE	
Input voltage acc. to UL	

Line frequency	
<b>Input current</b>	
from load voltage L+ (without load), max.	240 mA
from backplane bus 5 V DC, max.	100 mA
<b>Output current</b>	
horizontal installation	
vertical installation	
<b>Encoder supply</b>	
Output current	
5 V encoder supply	
24 V encoder supply	
Additional 24 V encoder supply	
<b>Power loss</b>	
Power loss, typ.	3 W
<b>Memory</b>	
Work memory	
Working memory for additional functions	
<b>Battery</b>	
Design	
<b>CPU-blocks</b>	
DB	
FB	
FC	
<b>Counters, timers and their retentivity</b>	
S7 counter	
IEC counter	
S7 times	
<b>Data areas and their retentivity</b>	
Flag	
<b>Address area</b>	
I/O address area	
of which distributed	
per integrated IO subsystem	
Process image	
Subprocess images	
Digital channels	
Analog channels	
Addressing volume	
<b>Hardware configuration</b>	
Formation of potential groups	
Module exchange	
Interface modules	
Number of DP masters	
Number of IO Controllers	
Number of operable FMs and CPs (recommended)	
Expansion modules	
Rack	
Submodules	
Selection of BaseUnit for connection variants	
PtP CM	
<b>Time of day</b>	
Clock	
Operating hours counter	
Time switching clocks	
<b>Digital inputs</b>	
Number of simultaneously controllable inputs	

all mounting positions	
horizontal installation	
Digital input functions, parameterizable	
Input voltage	
Input current	
for 10 k switched contact	
Internal preparation time	
Input delay (for rated value of input voltage)	
for standard inputs	
for interrupt inputs	
Encoder connection	
Connection method	
<b>Digital outputs</b>	
Digital output functions, parameterizable	
Control supply voltage	
Switching capacity of the outputs	
Load resistance range	
Trend key points E	
Output voltage	
Output current	
Output delay with resistive load	
Parallel switching of two outputs	
Switching frequency	
Total current of the outputs	
horizontal installation	
Total current of the outputs (per group)	
all mounting positions	
horizontal installation	
vertical installation	
Total current of the outputs (per module)	
all mounting positions	
horizontal installation	
Pulse output (passive)	
Frequency output	
Relay outputs	
Integrated high-speed cams	
<b>Analog inputs</b>	
Number of analog inputs	8
permissible input voltage for voltage input (destruction limit), max.	75 V; 20 V DC permanent, 75 V DC for max. 1 s (duty factor 1:20)
Constant measurement current for resistance-type transmitter, typ.	0.7 mA
<b>Input ranges</b>	
• Voltage	No
• Current	No
• Thermocouple	Yes
• Resistance thermometer	No
• Resistance	No
<b>Measuring range</b>	
<b>Input ranges (rated values), voltages</b>	
• 0 to +10 V	No
• 1 V to 5 V	No
• 1 V to 10 V	No
• -1 V to +1 V	No
• -10 V to +10 V	No
• -2.5 V to +2.5 V	No
• -250 mV to +250 mV	No
• -5 V to +5 V	No
• -50 mV to +50 mV	No

• -500 mV to +500 mV	No
• -80 mV to +80 mV	No
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	No
• -10 mA to +10 mA	No
• -20 mA to +20 mA	No
• -3.2 mA to +3.2 mA	No
• 4 mA to 20 mA	No
<b>Input ranges (rated values), thermocouples</b>	
• Type B	Yes
• Type C	Yes
• Type E	Yes
• Type J	Yes
• Type K	Yes
• Type L	Yes
• Type N	Yes
• Type R	Yes
• Type S	Yes
• Type T	Yes
• Type U	Yes
• Type TXK/TXK(L) to GOST	Yes
<b>Input ranges (rated values), resistance thermometer</b>	
• Cu 10	No
• Ni 100	No
• Ni 1000	No
• LG-Ni 1000	No
• Ni 120	No
• Ni 200	No
• Ni 500	No
• Pt 100	No
• Pt 1000	No
• Pt 200	No
• Pt 500	No
<b>Input ranges (rated values), resistors</b>	
• 0 to 150 ohms	No
• 0 to 300 ohms	No
• 0 to 600 ohms	No
• 0 to 6000 ohms	No
<b>Input ranges (rated values), strain gauges (full bridges)</b>	
<b>Thermocouple (TC)</b>	
<b>Temperature compensation</b>	
— parameterizable	Yes
— internal temperature compensation	Yes
— external temperature compensation with Pt100	Yes
— external temperature compensation with compensations socket	Yes
— for definable comparison point temperature	Yes
<b>Characteristic linearization</b>	
• parameterizable	Yes
— for thermocouples	Type B, E, J, K, L, N, R, S, T, U, C
<b>Connection method</b>	
<b>Cable length</b>	
• shielded, max.	100 m
<b>Analog outputs</b>	
<b>Output ranges, voltage</b>	
<b>Output ranges, current</b>	
<b>Connection of actuators</b>	
<b>Load impedance (in rated range of output)</b>	

Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
<ul style="list-style-type: none"> <li>Resolution with overrange (bit including sign), max.</li> <li>Integration time, parameterizable</li> <li>Basic conversion time (ms)</li> </ul>	16 bit; Two's complement Yes Up to 4 channels: 10 ms per module, 5 channels upwards: 190 ms per module
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
Encoder	
Connectable encoders	
Incremental encoder	
Encoder signals, incremental encoder (symmetrical)	
Encoder signals, incremental encoder (asymmetrical)	
Encoder signals, absolute encoder (SSI)	
Encoder signals, IEPE	
Drive axis	
EC motor	
Errors/accuracies	
Operational error limit in overall temperature range	
<ul style="list-style-type: none"> <li>Thermocouple, relative to input range, (+/-)</li> </ul>	Type T: $\pm 0.18\%$ , Type U: $\pm 0.15\%$ , Type E: $\pm 0.12\%$ , Type J: $\pm 0.12\%$ , Type L: $\pm 0.17\%$ , Type K: $\pm 0.15\%$ , Type N: $\pm 0.17\%$ , Type R: $\pm 0.08\%$ , Type S: $\pm 0.10\%$ , Type B: $\pm 0.13\%$ , Type C: $\pm 0.10\%$ , TXK/XK(L): $\pm 1.00\%$ accuracy in the lower range of the characteristic curve
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> <li>Thermocouple, relative to input range, (+/-)</li> </ul>	Type T: $\pm 0.13\%$ , Type U: $\pm 0.08\%$ , Type E: $\pm 0.05\%$ , Type J: $\pm 0.04\%$ , Type L: $\pm 0.06\%$ , Type K: $\pm 0.04\%$ , Type N: $\pm 0.04\%$ , Type R: $\pm 0.03\%$ , Type S: $\pm 0.03\%$ , Type B: $\pm 0.05\%$ , Type C: $\pm 0.02\%$ , TXK/XK(L): $\pm 0.67\%$ accuracy in the lower range of the characteristic curve
Power electronics	
Control of heating elements	
Load connection type	
Setpoint input	
Heating power	
Interfaces	
Video interfaces	
Touch interfaces	
MPI	
PROFIBUS DP	
PROFIBUS PA	
Supports protocol for PROFINET IO	
PROFINET functions	
Industrial Ethernet	
Point-to-point connection	
Integrated protocol driver	
Telegram length, max.	
Transmission rate, 20 mA (TTY)	
Transmission rate, RS 422/485	
Transmission speed, RS 232	
Signals	
ET-Connection	
EtherNet/IP	
AS-Interface	
WLAN	
1. Interface	
Interface types	
Protocols	
MPI	
PROFIBUS DP master	
Services	

PROFIBUS DP slave
PROFINET IO Controller
Services
Update time for IRT
PROFINET IO Device
Services
PROFINET CBA
Open IE communication
CAN
BACnet
<b>2. Interface</b>
Interface types
Protocols
PROFIBUS DP master
Services
PROFIBUS DP slave
PROFINET IO Controller
Services
Update time for IRT
PROFINET IO Device
Services
PROFINET CBA
<b>3. Interface</b>
Interface types
Protocols
PROFIBUS DP master
Services
PROFIBUS DP slave
PROFINET IO Controller
PROFINET IO Device
Services
PROFINET CBA
<b>4. Interface</b>
Interface types
Protocols
PROFIBUS DP master
PROFINET IO Controller
<b>Interface types</b>
RJ 45 (Ethernet)
RS 232
RS 485
RS 422
USB port
<b>Protocols</b>
Protocols (USB)
Protocols (Ethernet)
WEB characteristics
Protocols (terminal link)
Number of connections
PROFINET IO Device
Redundancy mode
SIMATIC communication
EtherNet/IP
Services
Updating times
Redundancy mode
Open IE communication
Web server

PROFIBUS DP	
PROFIdrive	
DALI	
Integrated protocols	
Freeport	
3964 (R)	
OPC UA	
<b>Communication functions</b>	
Global data communication	
S7 basic communication	
S7 communication	
LOGO! communication	
S5 compatible communication	
Standard communication (FMS)	
PROFINET CBA (at set setpoint communication load)	
Remote interconnections with acyclic transmission	
Remote interconnections with cyclic transmission	
iPAR server	
Number of connections	
<b>Test commissioning functions</b>	
Status/control	
Forcing	
Diagnostic buffer	
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable per group
• Limit value alarm	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable, channels 0 to 7
Diagnoses	
• Diagnostic information readable	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
<b>Integrated Functions</b>	
Monitoring functions	
Safety monitoring functions	
Counting functions	
Load cell	
Position detection	
Control technology	
Step-by-step controllers	
Pulse generator	
Measuring functions	
Operating mode for measured value acquisition	
Measuring range	
Accuracy	
Measuring inputs for voltage	
Measuring inputs for current	
Measuring inputs for current (Rog. or I/U converter)	
Error limits	
<b>Counter</b>	
Counting mode	
External gate counters	
Counter input 5 V	
Counter input 24 V	
<b>Drive interface</b>	
Signal Input	

Potential separation	
Potential separation digital inputs	
Potential separation digital outputs	
Potential separation analog inputs	
<ul style="list-style-type: none"> <li>● between the channels</li> <li>● between the channels, in groups of</li> <li>● between the channels and backplane bus</li> <li>● between the channels and the power supply of the electronics</li> </ul>	Yes 2 Yes Yes
Potential separation analog outputs	
Potential separation channels	
Potential separation valve outputs	
Potential separation counter	
Potential separation controller	
Isolation	
Isolation tested with	500 V DC
EMC	
Interference immunity against discharge of static electricity	
Interference immunity against high-frequency electromagnetic fields	
Interference immunity to cable-borne interference	
Interference immunity against voltage surge	
Interference immunity against conducted variable disturbance induced by high-frequency fields	
Interference immunity to magnetic fields	
Emission of radio interference acc. to EN 55 011	
Emission of radio interference acc. to EN 55 022	
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
Highest safety class achievable for safety-related tripping of standard modules	
Highest safety class achievable for deactivated dark test	
Use in hazardous areas	
Marine approval	
Ambient conditions	
Free fall	
Ambient temperature during operation	
Operation (vertical installation)	
Air pressure acc. to IEC 60068-2-13	
Vibrations	
Shock testing	
Resistance	
Coolants and lubricants	
Fire resistance	
Pollutant concentrations	
Hardware requirement	
Processor	
Graphic	
Operating systems	
pre-installed operating system	
Runs under operating system	
Software	
Preinstalled	
Software functions	
Multi-user system	
Runtime software	
Runtime	
Block	
Adjustable parameters	
Configuration	



Configuration
Configuration software
Script languages (Runtime)
Programming
Programming language
Configuration examples
Software libraries
Know-how protection
Access protection
<b>Languages</b>
Online languages
<b>Functionality under WinCC (TIA Portal)</b>
Multiproject
Message system
Recipe management
Variables
Images
Image objects
Complex image objects
Attributes for dynamic objects
Lists
Archiving
Filters
Security
Data carrier support
Logging through printer
Character sets
Transfer (upload/download)
Process coupling
Functions
<b>Functionality under WinCC Unified</b>
Parameter set management (recipes)
Image objects
<b>Connection method</b>
required front connector
ET-Connection
Terminals
Connection I/O signals
Conductor cross-section in mm <sup>2</sup>
Conductor cross-section acc. to AWG
<b>Dimensions</b>
Width
Height
Depth
<b>Weights</b>
Weight, approx.
<b>Other</b>
Data for selecting a voltage transformer

last modified:

3/2/2021 