## Data sheet

SIMATIC ET 200SP, ANALOG INPUT MODULE, AI 4XU/I 2-WIRE STANDARD, PACKING UNIT: 1 PIECE, FITS TO BU-TYPE A0, A1, COLOR CODE CC03, MODULE DIAGNOSIS, 16BIT, +/-0,3%



General information	
Product type designation	Al 4x U/I 2-wire, PU 1
HW functional status	From FS02
Firmware version	
<ul> <li>FW update possible</li> </ul>	Yes
usable BaseUnits	BU type A0, A1
Color code for module-specific color identification plate	CC03
Product function	
• I&M data	Yes; I&M0 to I&M3
Measuring range scalable	No
Engineering with	
<ul> <li>STEP 7 TIA Portal configurable/integrated as of version</li> </ul>	V14 / -
<ul> <li>STEP 7 configurable/integrated as of version</li> </ul>	V5.6 and higher
<ul> <li>PCS 7 configurable/integrated as of version</li> </ul>	V8.1 SP1
<ul> <li>PROFIBUS as of GSD version/GSD revision</li> </ul>	One GSD file each, Revision 3 and 5 and higher
<ul> <li>PROFINET as of GSD version/GSD revision</li> </ul>	GSDML V2.3
Operating mode	

Oversampling	No
• MSI	No
CiR – Configuration in RUN	
Reparameterization possible in RUN	Yes
Calibration possible in RUN	No
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Input current	
Current consumption, max.	37 mA; without sensor supply
Financia superb	
Encoder supply 24 V encoder supply	
• 24 V	Yes
	Yes
Short-circuit protection	
Output current, max.	20 mA; max. 50 mA per channel for a duration < 10 s
Power loss	
Power loss, typ.	0.85 W; Without encoder supply voltage
Address area	
Address space per module	
Address space per module, max.	8 byte; + 1 byte for QI information
llanduran and musting	
Hardware configuration  Automatic encoding	
	Vaa
Mechanical coding element	Yes
Selection of BaseUnit for connection variants	
2-wire connection	BU type A0, A1
Analog inputs	
Number of analog inputs	4; Differential inputs
permissible input voltage for voltage input (destruction limit), max.	30 V
permissible input current for current input (destruction limit), max.	50 mA
Cycle time (all channels), min.	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)
Input ranges (rated values), voltages	
• 0 to +10 V	Yes; 15 bit
• Input resistance (0 to 10 V)	120 kΩ
• 1 V to 5 V	Yes; 15 bit
• Input resistance (1 V to 5 V)	120 kΩ
mput resistance (TV to 5 V)	

• -10 V to +10 V	Yes; 16 bit incl. sign
• Input resistance (-10 V to +10 V)	120 kΩ
• -5 V to +5 V	Yes; 16 bit incl. sign
• Input resistance (-5 V to +5 V)	120 kΩ
Input ranges (rated values), currents	
• 0 to 20 mA	Yes; 15 bit
<ul><li>Input resistance (0 to 20 mA)</li></ul>	100 $\Omega$ ; + approx. 0.7 V diode forward voltage
• 4 mA to 20 mA	Yes; 15 bit
<ul> <li>Input resistance (4 mA to 20 mA)</li> </ul>	100 $\Omega$ ; + approx. 0.7 V diode forward voltage
Cable length	
• shielded, max.	1 000 m; 200 m for voltage measurement

Analog value generation for the inputs	
Measurement principle	integrating (Sigma-Delta)
Integration and conversion time/resolution per channel	
<ul> <li>Resolution with overrange (bit including sign), max.</li> </ul>	16 bit
<ul> <li>Integration time, parameterizable</li> </ul>	Yes
<ul> <li>Interference voltage suppression for interference frequency f1 in Hz</li> </ul>	16.6 / 50 / 60 Hz
<ul> <li>Conversion time (per channel)</li> </ul>	180 / 60 / 50 ms
Smoothing of measured values	
<ul> <li>Number of smoothing levels</li> </ul>	4; None; 4/8/16 times
parameterizable	Yes

Encoder	
Connection of signal encoders	
for voltage measurement	Yes
• for current measurement as 2-wire transducer	Yes
<ul> <li>Burden of 2-wire transmitter, max.</li> </ul>	650 Ω
• for current measurement as 4-wire transducer	No

Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %
Temperature error (relative to input range), (+/-)	0.005 %/K
Crosstalk between the inputs, min.	50 dB
Repeat accuracy in steady state at 25 °C (relative to	0.05 %
input range), (+/-)	
Operational error limit in overall temperature range	
<ul><li>Voltage, relative to input range, (+/-)</li></ul>	0.5 %
<ul><li>Current, relative to input range, (+/-)</li></ul>	0.5 %
Basic error limit (operational limit at 25 °C)	
<ul> <li>Voltage, relative to input range, (+/-)</li> </ul>	0.3 %
<ul><li>Current, relative to input range, (+/-)</li></ul>	0.3 %

Series mode interference (peak value of interference rated value of input range), min.  Common mode voltage, max. Common mode interference, min.  10 V 90 dB  Sochronous peration (application synchronized up to terminal) Interrupts/disenostics/status information Diagnostics function  No Diagnostic slarm Diagnostic ratem No Diagnostic ratem No Diagnostic messages  Monitoring the suppty voltage Ves: Ves: A to 20 mA Short-circuit Ves: With 1 to 5 V or 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply verse of channel status display For channel separation  Potential separation Potential separation channels  Detween the channels and backplane bus Ebetween the channels and backplane bus Ebetween the channels and the power supply of the electronics  Solation  Isolation tested with  707 V DC (type test)  Standards, approvals, certificates Suitable for applications according to CNI-9  Ves: Cardential installation, min.  - 30 °C	Interference voltage suppression for f = n x (f1 +/- 1 %),	, f1 = interference frequency
Common mode voltage, max. Common mode interference, min.  Standards, approvals, certificates  Suitable for applications according to AMS 2750  Isochronous mode  Isochronous mode  Isochronous operation (application synchronized up to terminal)  Interrupts/diagnostics/status information  Diagnostics function  Alarms  Diagnostic alarm Diagnostic messages  Monthoring the supply voltage Wire-break Short-circuit Standards, approvals, certificates  Potential separation of Conformity, see online support entry 109757262  Suitable for applications according to COI-9  Ambient conditions  Ambient conditions  Ambient conditions  Ambient conditions  Potential commons operation (application synchronized up to the remove the channels and backplane bus the electronics  Potential separation of Conformity, see online support entry 109757262  Suitable for applications according to COI-9  Ambient conditions  Ambient conditions  Potential conditions  Ambient conditions  Ambient conditions	· ·	70 dB
Scchronous mode Isochronous operation (application synchronized up to terminal) Interrupts/diagnostics/status information Diagnostics function Alarms  Diagnostic alarm  Diagnostic alarm  Limit value alarm  No Diagnostic messages  Monitoring the supply voltage  Wire-break  Short-circuit  Yes  Yes; at 4 to 20 mA  Yes with 1 to 5 V or 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply of ground or of an input to the encoder supply of ground or of an input to the encoder supply of ground or of an input to the encoder supply of channel status display  for channel status display  for channel status display  for channel diagnostics  To module diagnostics  between the channels  between the channels and backplane bus  between the channels and the power supply of the electronics  Solation  Isolation tested with  707 V DC (type test)  Standards, approvals, certificates  Suitable for applications according to CNI-9  Ambient conditions  Ambient conditions  Ambient conditions  Ambient conditions		10 V
Isochronous mode Isochronous operation (application synchronized up to terminal)  Interrupts/diagnostics/status information  Diagnostics function  Alarms  • Diagnostic calarm • Limit value alarm  • Diagnostic messages  • Monitoring the supply voltage • Wire-break • Short-circuit • Short-circuit • Short-circuit • Group error • Overtlow/underflow  Diagnostis indication LED  • Monitoring of the supply voltage (PWR-LED) • Channel status display • for channel diagnostics • for module diagnostics • for module diagnostics • between the channels • between the channels and backplane bus • between the channels and backplane bus • between the channels and the power supply of the electronics  Isolation  Isolation  Status for applications according to AMS 2750  Suitable for applications according to CQI-9  Ambient conditions  Ambient conditions  Ambient conditions  Pess  Pess  Ambient conditions  Pess  Pes		
Isochronous operation (application synchronized up to terminal)  Interrupts/diagnostics/status information  Diagnostics function  • Diagnostic starm • Limit value alarm  • Diagnostic messages • Monitoring the supply voltage • Wire-break • Short-circuit • Short-circuit • Group error • Overflow/underflow  Diagnostics indication LED • Monitoring of the supply voltage (PWR-LED) • Monitoring of the supply voltage (PWR-LED) • Channel status display • for channel diagnostics • for module diagnostics • for module diagnostics • between the channels • between the channels and backplane bus • between the channels and the power supply of the electronics  Isolation  Isolation tested with  707 V DC (type test)  Ambient conditions  Ambient conditions  Ambient temperature during operation	Common mode interierence, min.	90 db
Interrupts/diagnostics/status information Diagnostics function Alarms  • Diagnostic alarm • Limit value alarm No Diagnostic messages • Monitoring the supply voltage • Wire-break • Short-circuit • Short-circuit • Yes; with 1 to 5 V or 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply • Group error • Overflow/underflow Possostics indication LED • Monitoring of the supply voltage (PWR-LED) • Channel status display • for channel diagnostics • for module diagnostics • for module diagnostics • between the channels • between the channels and backplane bus • between the channels and the power supply of the electronics  Isolation  Isolation  Isolation  Standards, approvals, certificates  Ambient conditions  Ambient conditions  Ambient conditions  Ambient conditions	Isochronous mode	
Interrupts/diagnostics/status information  Diagnostics function  Alarms  • Diagnostic alarm  • Limit value alarm  Diagnostic messages  • Monitoring the supply voltage  • Wire-break  • Short-circuit  • Short-circuit  • Group error  • Overflow/underflow  Diagnostics indication LED  • Monitoring of the supply voltage (PWR-LED)  • Channel status display  • for channel diagnostics  • for module diagnostics  • between the channels  • between the channels and backplane bus  • between the channels and the power supply of the electronics  Isolation  Isolation tested with  707 V DC (type test)  Yes: Outpersonable of the supply test of conformity, see online support entry 109757262  Suitable for applications according to CQI-9  Ambient conditions  Ambient conditions  Ambient conditions		No
Diagnostics function  Alarms  Diagnostic alarm Limit value alarm  No  Diagnostic messages  Monitoring the supply voltage Wire-break Short-circuit Signostic messages  Monitoring the supply voltage Wire-break Short-circuit Signostic messages  Monitoring the supply voltage Wire-break Short-circuit Signostic messages  Monitoring of the supply voltage Wire-break Short-circuit Signostic messages  Monitoring of an input to the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply to ground or of an input to the encoder supply of the supply to ground or of an input to the encoder supply of yes; Green LED  Monitoring of the supply voltage (PWR-LED) Yes; Green LED Yes; Green LED Yes; Green/red LED  Potential separation  Potential separation Potential separation channels  Setween the channels and backplane bus Setween the channels and backplane bus Setween the channels and the power supply of the electronics  Solation  Isolation  Isolation tested with  707 V DC (type test)  Standards, approvals, certificates Suitable for applications according to AMS 2750 Yes; Declaration of Conformity, see online support entry 109757262  Suitable for applications according to CQI-9  Ambient conditions Ambient conditions	to terminal)	
Alarms  Diagnostic alarm Limit value alarm No  Diagnostic messages  Monitoring the supply voltage Short-circuit Group error Overflowfunderflow Potential separation  Potential separation channels between the channels and backplane bus between the channels and the power supply of the electronics  Potential separation  Potential separation  Potential separation  Potential separation channels Sepa	Interrupts/diagnostics/status information	
Diagnostic alarm Limit value alarm No  Diagnostic messages  Monitoring the supply voltage Ves: at 4 to 20 mA Short-circuit Short-circuit Group error Overflow/underflow Ves: Green LED Monitoring of the supply voltage (PWR-LED) Channel status display For channel diagnostics For module diagnostics For module diagnostics Short-circuit Ves: Green LED  Ves: Green LED  Ves: Green LED Ves: Green LED  V	Diagnostics function	Yes
Limit value alarm No Diagnostic messages  Monitoring the supply voltage Wire-break Short-circuit Group error Overflow/underflow Piagnostics indication LED  Monitoring of the supply voltage (PWR-LED) Channel status display For channel diagnostics For module diagnostics For module diagnostics  Potential separation  Potential separation channels  between the channels and backplane bus between the channels and the power supply of the electronics  Isolation  Isolation tested with  Tor V DC (type test)  Ambient conditions  Ambient conditions  Ambient conditions  No  Yes  Yes  Yes  Yes  Green LED  Yes  Yes  Green LED  Yes  Yes  Green/red LED  Yes  Yes  Yes  Yes  Yes  Yes  Yes  Ye	Alarms	
Diagnostic messages  Monitoring the supply voltage Wire-break Short-circuit Stort-circuit Singular (PWR-LED) Channel status display For module diagnostics For module diagnostics For module diagnostics For etheren the channels For etheren the channels and backplane bus For the electronics For the electronics  Isolation Isolation Isolation stored and populations  Monitoring of the supply voltage (PWR-LED) For example of the supply voltage (PWR-LED) For example of the supply voltage (PWR-LED) For module diagnostics For each LED For each LE	Diagnostic alarm	Yes
Monitoring the supply voltage Wire-break Short-circuit Stroup error Overflow/underflow Potential separation Potential separation Potential separation Potential separation  Detween the channels and backplane bus between the channels and the power supply of the electronics  Isolation Isolation tested with  Standards, approvals, certificates Suitable for applications according to CQI-9  Monitoring the supply voltage (PWR-LED) Yes; at 4 to 20 mA Yes; with 1 to 5 V or 2-wire mode: Short-circuit of the encoder supply of the supply voltage (PWR-LED) Yes; Green LED Yes; Green LED Yes; Green/red LED  Potential separation  Yes; channel group-specific between 2-wire current input group and voltage input group Yes Yes; only for voltage inputs  Standards, approvals, certificates Suitable for applications according to CQI-9  Ambient conditions  Ambient temperature during operation	Limit value alarm	No
Wire-break     Short-circuit     Short-circuit of the encoder supply to ground or of an input to the encoder supply     Yes     Overflow/underflow     Short-circuit of the encoder supply to ground or of an input to the encoder supply     Yes     Short-circuit of the encoder supply of an input to the encoder supply     Yes     Steren LED     Nonitoring of the supply voltage (PWR-LED)     Steren LED     Steren LED     Steren LED     Steren LED     Steren/red LED  Potential separation  Potential separation  Potential separation  Potential separation channels     Steren LED     Steren/red LED  Potential separation  Potential	Diagnostic messages	
Short-circuit  Yes; with 1 to 5 V or 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply  Group error  Overflow/underflow  Pos  Diagnostics indication LED  Monitoring of the supply voltage (PWR-LED) Channel status display For channel diagnostics For module diagnostics For en LED	<ul> <li>Monitoring the supply voltage</li> </ul>	Yes
supply to ground or of an input to the encoder supply  • Group error • Overflow/underflow  Diagnostics indication LED  • Monitoring of the supply voltage (PWR-LED) • Channel status display • for channel diagnostics • for module diagnostics • for module diagnostics  • between the channels • between the channels • between the channels and backplane bus • between the channels and the power supply of the electronics  Isolation  Isolation tested with  707 V DC (type test)  Standards, approvals, certificates  Suitable for applications according to CQI-9  Ambient conditions  Ambient temperature during operation	Wire-break	Yes; at 4 to 20 mA
Group error     Overflow/underflow     Piagnostics indication LED     Monitoring of the supply voltage (PWR-LED)     Channel status display     For channel diagnostics     for module diagnostics     Fotential separation  Potential separation  Potential separation  Potential separation channels     between the channels     between the channels     between the channels and backplane bus     between the channels and the power supply of the electronics  Isolation  Isolation  Standards, approvals, certificates  Suitable for applications according to AMS 2750  Ambient conditions  Ambient temperature during operation  Yes; Green LED  Yes; Green LED  Yes; Green/red LED  Yes; Channel group-specific between 2-wire current input group and voltage input group  Yes  Yes; only for voltage inputs  Yes; only for voltage inputs  Yes; Declaration of Conformity, see online support entry 109757262  Yes  Ambient temperature during operation	Short-circuit	Yes; with 1 to 5 V or 2-wire mode: Short-circuit of the encoder
Overflow/underflow  Diagnostics indication LED  Monitoring of the supply voltage (PWR-LED) Channel status display of channel diagnostics of module diagnostics of module diagnostics Ves; Green LED  Potential separation  Potential separation  Potential separation  Potential separation channels  between the channels obetween the channels and backplane bus between the channels and backplane bus between the channels and the power supply of the electronics  Isolation  Isolation tested with  707 V DC (type test)  Standards, approvals, certificates  Suitable for applications according to CQI-9  Ambient conditions  Ambient temperature during operation		supply to ground or of an input to the encoder supply
Diagnostics indication LED  • Monitoring of the supply voltage (PWR-LED) • Channel status display • for channel diagnostics • for module diagnostics  • for module diagnostics  Potential separation  Potential separation channels  • between the channels  • between the channels and backplane bus • between the channels and the power supply of the electronics  Isolation  Isolation  Standards, approvals, certificates  Suitable for applications according to CQI-9  Ambient conditions  Ambient temperature during operation	Group error	Yes
Monitoring of the supply voltage (PWR-LED)     Channel status display     for channel diagnostics     for module diagnostics     for module diagnostics     Yes; Green/red LED  Potential separation  Potential separation channels     between the channels     between the channels and backplane bus     between the channels and the power supply of the electronics  Isolation  Isolation  Standards, approvals, certificates  Suitable for applications according to AMS 2750  Suitable for applications according to CQI-9  Ambient conditions  Ambient temperature during operation  Yes; Green LED  Yes; Green Les	<ul><li>Overflow/underflow</li></ul>	Yes
Channel status display for channel diagnostics for module diagnostics  Potential separation  Potential separation channels  between the channels between the channels between the channels between the channels and backplane bus between the channels and the power supply of the electronics  Isolation Isolation tested with  To7 V DC (type test)  Standards, approvals, certificates  Suitable for applications according to AMS 2750  Suitable for applications according to CQI-9  Ambient conditions  Ambient temperature during operation	Diagnostics indication LED	
• for channel diagnostics     • for module diagnostics     • for module diagnostics  Potential separation  Potential separation channels  • between the channels  • between the channels  • between the channels and backplane bus  • between the channels and the power supply of the electronics  Isolation  Isolation tested with  To7 V DC (type test)  Standards, approvals, certificates  Suitable for applications according to AMS 2750  Suitable for applications according to CQI-9  Ambient conditions  Ambient temperature during operation	<ul><li>Monitoring of the supply voltage (PWR-LED)</li></ul>	Yes; Green LED
• for module diagnostics      Potential separation  Potential separation channels      • between the channels      • between the channels      • between the channels and backplane bus      • between the channels and the power supply of the electronics  Isolation  Isolation tested with  Tor V DC (type test)  Standards, approvals, certificates  Suitable for applications according to AMS 2750  Suitable for applications according to CQI-9  Ambient conditions  Ambient temperature during operation	<ul> <li>Channel status display</li> </ul>	Yes; Green LED
Potential separation  Potential separation channels  • between the channels  • between the channels and backplane bus  • between the channels and the power supply of the electronics  Isolation  Isolation tested with  Tor V DC (type test)  Standards, approvals, certificates  Suitable for applications according to AMS 2750  Suitable for applications according to CQI-9  Ambient conditions  Ambient temperature during operation	<ul> <li>for channel diagnostics</li> </ul>	No
Potential separation channels  • between the channels  • between the channels and backplane bus • between the channels and the power supply of the electronics    Standards, approvals, certificates	• for module diagnostics	Yes; Green/red LED
between the channels	Potential separation	
and voltage input group Yes  between the channels and the power supply of the electronics  Isolation Isolation tested with  707 V DC (type test)  Standards, approvals, certificates  Suitable for applications according to AMS 2750  Suitable for applications according to CQI-9  Ambient conditions  Ambient temperature during operation	Potential separation channels	
between the channels and the power supply of the electronics  Isolation  Isolation tested with  707 V DC (type test)  Standards, approvals, certificates  Suitable for applications according to AMS 2750  Suitable for applications according to CQI-9  Ambient conditions  Ambient temperature during operation  Yes; only for voltage inputs	• between the channels	
Isolation Isolation tested with 707 V DC (type test)  Standards, approvals, certificates Suitable for applications according to AMS 2750 Yes; Declaration of Conformity, see online support entry 109757262 Suitable for applications according to CQI-9 Yes  Ambient conditions Ambient temperature during operation	<ul> <li>between the channels and backplane bus</li> </ul>	Yes
Isolation tested with  707 V DC (type test)  Standards, approvals, certificates  Suitable for applications according to AMS 2750  Yes; Declaration of Conformity, see online support entry 109757262  Suitable for applications according to CQI-9  Ambient conditions  Ambient temperature during operation		Yes; only for voltage inputs
Standards, approvals, certificates  Suitable for applications according to AMS 2750  Yes; Declaration of Conformity, see online support entry 109757262  Suitable for applications according to CQI-9  Yes  Ambient conditions  Ambient temperature during operation	Isolation	
Suitable for applications according to AMS 2750  Yes; Declaration of Conformity, see online support entry 109757262  Suitable for applications according to CQI-9  Yes  Ambient conditions  Ambient temperature during operation	Isolation tested with	707 V DC (type test)
Suitable for applications according to CQI-9  Ambient conditions  Ambient temperature during operation	Standards, approvals, certificates	
Ambient conditions  Ambient temperature during operation	Suitable for applications according to AMS 2750	
Ambient temperature during operation	Suitable for applications according to CQI-9	Yes
	Ambient conditions	
<ul> <li>◆ horizontal installation, min.</li> <li>-30 °C</li> </ul>	Ambient temperature during operation	
	horizontal installation, min.	-30 °C

<ul> <li>horizontal installation, max.</li> </ul>	60 °C
• vertical installation, min.	-30 °C
<ul><li>vertical installation, max.</li></ul>	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
D: .	

Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm

Weights 31 g Weight, approx.

12/14/2019 last modified: