SIEMENS

Data sheet

6ES7136-6AA00-0CA1



SIMATIC DP, ELECTRONIC MODULE ET 200SP, F-AI 4xI(0)4..20mA HF FAILSAFE ANALOG INPUTS up to PL E (ISO 13849) up to SIL 3 (IEC 61508)

Product type designation F-AI 4x1 0(4).20mA 2-/4-wire HF Firmware version FV • FW update possible Yes usable BaseUnits BU type A0, A1 Color code for module-specific color identification plate FC000 • FM update possible Yes • I&M data Yes; I&M0 to I&M3 Engineering with • • STEP 7 TIA Portal configurable/integrated from version V15 with HSP 203 CIR - Configuration in RUN No Calibration possible in RUN No Supply voltage • Rated value (DC) 24 V permissible range, upper limit (DC) 19.2 V permissible range, upper limit (DC) 28.8 V Reverse polarity protection Yes power supply according to NEC Class 2 required No Input current 0.38 A Current consumption (rated value) 0.38 A Current consumption, max. 0.4 A Encoder supply • 24 V Yes; min. L+ (-1.5 V) • Short-circuit protection Yes • Output current, max. 300 mA; total current of all encoders/channels <t< th=""><th>General information</th><th></th></t<>	General information	
• FW update possibleYesusable BaseUnitsBU type A0, A1Color code for module-specific color identification plateCC00Product functionYes; I&M0 to I&M3• I&M dataYes; I&M0 to I&M3Engineering withV15 with HSP 203• STEP 7 TIA Portal configurable/integrated from versionV15 with HSP 203 CIR - Configuration in RUN NoCalibration possible in RUNNoCalibration possible in RUNNoCalibration possible in RUNNoSupply voltageV15 with HSP 203Rated value (DC)24 Vpermissible range, upper limit (DC)19.2 Vpermissible range, upper limit (DC)28.8 VReverse polarity protectionYespower supply according to NEC Class 2 requiredNoInput currentUrrent consumption, max.Current consumption, max.0.4 AEncoder supply24 V24 V encoder supply24 V24 V encoder supply20 mA; total current of all encoders/channelsPower available from the backplane bus70 mWPower loss, typ.2 WAddress area2 kWAddress space per module14 byte; S7-300/400F CPU, 13 byte 5 byte; S7-300/400F CPU, 4 byteHardware configurationYes Yes• Electornic coding element type FYes	Product type designation	F-AI 4xI 0(4)20mA 2-/4-wire HF
usable BaseUnitsBU type A0, A1 COlor code for module-specific color identification plateBU type A0, A1 CC00Product functionCC00I &M dataYes; I&M0 to I&M3Engineering withV15 with HSP 203• STEP 7 TIA Portal configurable/integrated from versionV15 with HSP 203Cali A - Configuration in RUNNo Calibration possible in RUN NoSupply voltageNo Calibration possible in RUN NoSupply voltage24 V permissible range, upper limit (DC)Pated value (DC) permissible range, upper limit (DC)28 N VesPower supply according to NEC Class 2 required Current consumption (rated value) Current consumption, max.0.38 A Ourent consumption, max.Current consumption, max.0.4 AEncoder supply23 V encoder supply• 24 V • Short-circuit protection • Ves No WresYes; min. L+ (-1.5 V) Ves 300 mA; total current of all encoders/channelsPower tossPower tossPower toss2 WPower toss2 WPower toss2 WPower toss2 WAddress area2 WAddress area14 byte; S7-300/400F CPU, 13 byte 5 byte; S7-300/400F CPU, 4 byteHardware configurationYes Yes• Electronic coding element type FYes	Firmware version	
Color code for module-specific color identification plate CC00 Product function • I&M data Yes; I&M0 to I&M3 Engineering with • STEP 7 TIA Portal configurable/integrated from version V15 with HSP 203 CiR - Configuration in RUN No Reparameterization possible in RUN No Supply voltage Rated value (DC) 24 V permissible range, lower limit (DC) 28 V permissible range, lower limit (DC) 28 V Reverse polarity protection Yes power supply according to NEC Class 2 required No Input current 0.38 A Current consumption (rated value) 0.38 A Current consumption, max. 0.4 A Encoder supply 24 V encoder supply Yes; min. L+ (-1.5 V) • Short-circuit protection Yes • Output current, max. 300 mA; total current of all encoders/channels Power • Output current, max. 300 mA; total current of all encoders/channels Power loss, typ. 2 W Address area	 FW update possible 	Yes
Product function IBM data Yes; I&M0 to I&M3 Engineering with STEP 7 TIA Portal configurable/integrated from version Carl Configuration in RUN Reparameterization possible in RUN No Calibration possible in RUN No Supply voltage Rated value (DC) P24 V permissible range, lower limit (DC) P32 V permissible range, lower limit (DC) P32 V permissible range, upper limit (DC) P38 V Reverse polarity protection Yes power supply according to NEC Class 2 required No Input current Current consumption, max. O.38 A Current consumption, max. O.4 A Encoder supply 24 V Yes; min. L+ (-1.5 V) Short-circuit protection Yes Output current, max. 300 mA; total current of all encoders/channels Power available from the backplane bus 70 mW Power loss. Power loss. Power loss. Power loss. Power loss. Power loss Power loss. Power loss. Power loss. Power loss. Power source produle Inputs 14 byte: S7-300/400F CPU, 13 byte Outputs Styte: S7-300/400F CPU, 4 byte Hardware configuration Automatic encoding Yes Electronic coding element type F Yes Supplicit Coding element type F Yes	usable BaseUnits	BU type A0, A1
• I&M data Yes; I&M0 to I&M3 Engineering with • STEP 7 TIA Portal configurable/integrated from version V15 with HSP 203 V15 with HSP 203 CIR - Configuration in RUN No Reparameterization possible in RUN No Supply voltage No Rated value (DC) 24 V permissible range, lower limit (DC) 28.8 V Reverse polarity protection Yes power supply according to NEC Class 2 required No Current consumption (rated value) 0.38 A Current consumption, max. 0.4 A Encoder supply Coder supply 24 V Yes; min. L+ (-1.5 V) • Short-circuit protection Yes • Output current, max. 300 mA; total current of all encoders/channels Power Output current of all encoders/channels Power loss, typ. 2 W Address area Address area Address space per module 14 byte; S7-300/400F CPU, 13 byte • Unputs 14 byte; S7-300/400F CPU, 4 byte Hardware configuration Yes • Output current 5 byte; S7-300/400F CPU, 4 byte	Color code for module-specific color identification plate	CC00
Engineering with • STEP 7 TIA Portal configurable/integrated from version V15 with HSP 203 CIR - Configuration in RUN No Reparameterization possible in RUN No Calibration possible in RUN No Supply voltage No Rated value (DC) 24 V permissible range, lower limit (DC) 19.2 V permissible range, lower limit (DC) 28.8 V Reverse polarity protection Yes power supply according to NEC Class 2 required No Current consumption (rated value) 0.38 A Current consumption (rated value) 0.4 A Encoder supply 24 V • 24 V Yes; min. L+ (-1.5 V) • Short-circuit protection Yes; min. L+ (-1.5 V) • Short-circuit protection Yes; min. L+ (-1.5 V) • Output current, max. 300 mA; total current of all encoders/channels Power available from the backplane bus 70 mW Power loss 70 mW Power loss 2 W Address area 2 W Address area 2 W Address area 14 byte; S7-300/400F CPU, 13 byte • Outputs	Product function	
• STEP 7 TIA Portal configurable/integrated from version V15 with HSP 203 CiR - Configuration in RUN No Reparameterization possible in RUN No Calibration possible in RUN No Supply voltage Image: Configuration in RUN Rated value (DC) 24 V permissible range, upper limit (DC) 19.2 V permissible range, upper limit (DC) 28.8 V Reverse polarity protection Yes power supply according to NEC Class 2 required No Input current Current consumption (rated value) 0.38 A Current consumption, max. 0.4 A Encoder supply 24 V encoder supply 24 V Yes; min. L+ (-1.5 V) • Short-circuit protection Yes Yes • Output current, max. 300 mA; total current of all encoders/channels Power Output current, max. 2 W Power loss 70 mW Power loss Power loss 2 W 2 W Address area Address area Address area Address space per module 14 byte; S7-300/400F CPU, 13 byte • Linputs 5 byte; S7-300/400F CPU, 4 byte <tr< td=""><td>● I&M data</td><td>Yes; I&M0 to I&M3</td></tr<>	● I&M data	Yes; I&M0 to I&M3
version ciR - Configuration in RUN Reparameterization possible in RUN No Calibration possible in RUN No Supply voltage No 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 power supply according to NEC Class 2 required No Input current Current consumption (rated value) Current consumption, max. 0.4 A Encoder supply 24 V • 24 V Yes; min. L+ (-1.5 V) • Short-circuit protection Yes • 0utput current, max. 300 mA; total current of all encoders/channels Power Ower loss Power loss 70 mW Power loss 24 W Address area Address apage per module • Inputs 14 byte; S7-300/400F CPU, 13 byte • Outputs 5 byte; S7-300/400F CPU, 13 byte • Outputs 5 byte; S7-300/400F CPU, 4 byte	Engineering with	
Reparameterization possible in RUN No Calibration possible in RUN No Supply voltage		V15 with HSP 203
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 power supply according to NEC Class 2 required No Input current Current consumption (rated value) Current consumption (rated value) 0.38 A Current consumption (rated value) 0.4 A Encoder supply 24 V • 24 V Yes; min. L+ (-1.5 V) • Short-circuit protection Yes • Output current, max. 300 mA; total current of all encoders/channels Power loss 70 mW Power loss, typ. 2 W Address space per module 14 byte; S7-300/400F CPU, 13 byte • Outputs 14 byte; S7-300/400F CPU, 4 byte Hardware configuration Yes • Electronic coding element type F Yes	CiR - Configuration in RUN	
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 power supply according to NEC Class 2 required No Input current 0.38 A Current consumption (rated value) 0.38 A Current consumption, max. 0.4 A Encoder supply 44 V encoder supply • 24 V Yes; min. L+ (-1.5 V) • Short-circuit protection Yes • Output current, max. 300 mA; total current of all encoders/channels Power Power available from the backplane bus Power loss 70 mW Power loss 2 W Address space per module 14 byte; S7-300/400F CPU, 13 byte • Outputs 14 byte; S7-300/400F CPU, 4 byte Hardware configuration Yes Automatic encoding Yes • Electronic coding element type F Yes	Reparameterization possible in RUN	No
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 power supply according to NEC Class 2 required No Input current 0.38 A Current consumption (rated value) 0.38 A Current consumption, max. 0.4 A Encoder supply 24 V • 24 V Yes; min. L+ (-1.5 V) • Short-circuit protection Yes; • Output current, max. 300 mA; total current of all encoders/channels Power Output current, max. Power loss, typ. 2 W Address area 2 W Address area 14 byte; S7-300/400F CPU, 13 byte • Outputs 14 byte; S7-300/400F CPU, 4 byte Hardware configuration Yes Automatic encoding Yes • Electronic coding element type F Yes	Calibration possible in RUN	No
permissible range, lower limit (DC)19.2 Vpermissible range, upper limit (DC)28.8 VReverse polarity protectionYespower supply according to NEC Class 2 requiredNoInput currentCurrent consumption (rated value)0.38 ACurrent consumption, max.0.4 AEncoder supply24 V encoder supply• 24 VYes; min. L+ (-1.5 V)• Short-circuit protectionYes• Output current, max.300 mA; total current of all encoders/channelsPowerPower available from the backplane busPower loss, typ.2 WAddress area2 WAddress space per module14 byte; S7-300/400F CPU, 13 byte• Outputs5 byte; S7-300/400F CPU, 4 byteHardware configurationYesAutomatic encoding • Electronic coding element type FYesYesYes	Supply voltage	
permissible range, upper limit (DC)28.8 VReverse polarity protectionYespower supply according to NEC Class 2 requiredNoInput current0.38 ACurrent consumption (rated value)0.38 ACurrent consumption, max.0.4 AEncoder supply24 V encoder supply• 24 VYes; min. L+ (-1.5 V)• Short-circuit protectionYes• Output current, max.300 mA; total current of all encoders/channelsPowerPower loss, typ.Power loss, typ.2 WAddress pace per module14 byte; S7-300/400F CPU, 13 byte 5 byte; S7-300/400F CPU, 4 byteHardware configurationYes YesAutomatic encoding • Electronic coding element type FYes	Rated value (DC)	24 V
Reverse polarity protection power supply according to NEC Class 2 requiredYes NoInput current	permissible range, lower limit (DC)	19.2 V
power supply according to NEC Class 2 requiredNoInput current0.38 ACurrent consumption (rated value)0.38 ACurrent consumption, max.0.4 AEncoder supply24 V encoder supply• 24 VYes; min. L+ (-1.5 V)• Short-circuit protectionYes• Output current, max.300 mA; total current of all encoders/channelsPowerPower lossPower loss70 mWPower loss, typ.2 WAddress space per module14 byte; S7-300/400F CPU, 13 byte 5 byte; S7-300/400F CPU, 4 byteHardware configurationYes YesAutomatic encoding • Electronic coding element type FYes	permissible range, upper limit (DC)	28.8 V
Input current 0.38 A Current consumption (rated value) 0.38 A Current consumption, max. 0.4 A Encoder supply 24 V • 24 V Yes; min. L+ (-1.5 V) • Short-circuit protection Yes • Output current, max. 300 mA; total current of all encoders/channels Power Power loss Power loss 70 mW Power loss space per module 14 byte; S7-300/400F CPU, 13 byte • Outputs 5 byte; S7-300/400F CPU, 4 byte Hardware configuration Yes Automatic encoding Yes • Electronic coding element type F Yes	Reverse polarity protection	Yes
Current consumption (rated value) 0.38 A Current consumption, max. 0.4 A Encoder supply 24 V • 24 V Yes; min. L+ (-1.5 V) • Short-circuit protection Yes • Output current, max. 300 mA; total current of all encoders/channels Power Power Power loss 70 mW Power loss 2 W Address space per module 14 byte; S7-300/400F CPU, 13 byte • Outputs 5 byte; S7-300/400F CPU, 4 byte Hardware configuration Yes Automatic encoding Yes • Electronic coding element type F Yes	power supply according to NEC Class 2 required	No
Current consumption, max. 0.4 A Encoder supply 24 V encoder supply • 24 V Yes; min. L+ (-1.5 V) • Short-circuit protection Yes • Output current, max. 300 mA; total current of all encoders/channels Power Power available from the backplane bus Power loss 70 mW Power loss, typ. 2 W Address area Address space per module • Inputs 14 byte; S7-300/400F CPU, 13 byte • Outputs 5 byte; S7-300/400F CPU, 4 byte Hardware configuration Yes Automatic encoding Yes • Electronic coding element type F Yes	Input current	
Encoder supply 24 V encoder supply • 24 V • Short-circuit protection • Output current, max. 9 Ower Power available from the backplane bus 70 mW Power loss Power loss, typ. 2 W Address space per module • Inputs 14 byte; S7-300/400F CPU, 13 byte • Outputs 5 byte; S7-300/400F CPU, 4 byte Hardware configuration Yes Automatic encoding Yes • Electronic coding element type F Yes	Current consumption (rated value)	0.38 A
24 V encoder supply 24 V Short-circuit protection Short-circuit protection Yes Output current, max. Power Power loss Power loss, typ. Address space per module Inputs 14 byte; S7-300/400F CPU, 13 byte Outputs 5 byte; S7-300/400F CPU, 4 byte	Current consumption, max.	0.4 A
 24 V Short-circuit protection Output current, max. 300 mA; total current of all encoders/channels Power Power available from the backplane bus 70 mW Power loss Power loss, typ. 2 W Address area Address space per module Inputs Outputs 5 byte; S7-300/400F CPU, 13 byte Hardware configuration Automatic encoding Yes 	Encoder supply	
 Short-circuit protection Output current, max. 300 mA; total current of all encoders/channels Power Power available from the backplane bus 70 mW Power loss Power loss, typ. 2 W Address area Address space per module Inputs Outputs 14 byte; S7-300/400F CPU, 13 byte 5 byte; S7-300/400F CPU, 4 byte Hardware configuration Automatic encoding Yes 	24 V encoder supply	
• Output current, max. 300 mA; total current of all encoders/channels Power 70 mW Power loss 70 mW Power loss, typ. 2 W Address area 4ddress space per module • Inputs 14 byte; S7-300/400F CPU, 13 byte • Outputs 5 byte; S7-300/400F CPU, 4 byte Hardware configuration Yes • Electronic coding element type F Yes	• 24 V	Yes; min. L+ (-1.5 V)
Power Power available from the backplane bus 70 mW Power loss 2 W Power loss, typ. 2 W Address area 2 W Address space per module 14 byte; S7-300/400F CPU, 13 byte • Inputs 14 byte; S7-300/400F CPU, 13 byte • Outputs 5 byte; S7-300/400F CPU, 4 byte Hardware configuration Yes Automatic encoding Yes • Electronic coding element type F Yes	 Short-circuit protection 	Yes
Power available from the backplane bus 70 mW Power loss 2 Power loss, typ. 2 W Address area 2 Address space per module 14 byte; S7-300/400F CPU, 13 byte • Inputs 14 byte; S7-300/400F CPU, 13 byte • Outputs 5 byte; S7-300/400F CPU, 4 byte Hardware configuration Yes • Electronic coding element type F Yes	 Output current, max. 	300 mA; total current of all encoders/channels
Power loss 2 W Power loss, typ. 2 W Address area Address space per module • Inputs 14 byte; S7-300/400F CPU, 13 byte • Outputs 5 byte; S7-300/400F CPU, 4 byte Hardware configuration Yes • Electronic coding element type F Yes	Power	
Power loss, typ. 2 W Address area Address space per module • Inputs 14 byte; S7-300/400F CPU, 13 byte • Outputs 5 byte; S7-300/400F CPU, 4 byte Hardware configuration Yes • Electronic coding element type F Yes	Power available from the backplane bus	70 mW
Address area Address space per module • Inputs 14 byte; S7-300/400F CPU, 13 byte • Outputs 5 byte; S7-300/400F CPU, 4 byte Hardware configuration Automatic encoding Yes • Electronic coding element type F Yes	Power loss	
Address space per module • Inputs 14 byte; S7-300/400F CPU, 13 byte • Outputs 5 byte; S7-300/400F CPU, 4 byte Hardware configuration Yes • Electronic coding element type F Yes	Power loss, typ.	2 W
• Inputs 14 byte; S7-300/400F CPU, 13 byte • Outputs 5 byte; S7-300/400F CPU, 4 byte Hardware configuration 4000000000000000000000000000000000000	Address area	
• Outputs 5 byte; S7-300/400F CPU, 4 byte Hardware configuration Yes Automatic encoding Yes • Electronic coding element type F Yes	Address space per module	
Hardware configuration Automatic encoding Yes • Electronic coding element type F Yes	Inputs	
Automatic encoding Yes • Electronic coding element type F Yes	Outputs	5 byte; S7-300/400F CPU, 4 byte
Electronic coding element type F Yes	Hardware configuration	
	Automatic encoding	Yes
Analog inputs	 Electronic coding element type F 	Yes
	Analog inputs	

Number of analog inputs	4	
For current measurement	4	
permissible input current for current input (destruction		
limit), max.	00 11/1	
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
 Input resistance (0 to 20 mA) 	125 Ω	
• 4 mA to 20 mA	Yes	
— Input resistance (4 mA to 20 mA)	125 Ω	
Cable length		
 shielded, max. 	1 000 m	
Analog value generation for the inputs		
Measurement principle	Sigma Delta	
Integration and conversion time/resolution per channel		
 Resolution with overrange (bit including sign), max. 	16 bit	
Integration time, parameterizable	Yes	
Integration time (ms)	20 / 16,667	
 Interference voltage suppression for interference frequency f1 in Hz 	50 / 60 Hz	
Smoothing of measured values		
Number of smoothing levels	7	
parameterizable	Yes	
Step: None	Yes; 1x conversion cycle time	
• Step: low	Yes; 2x / 4x conversion cycle time	
Step: Medium	Yes; 8x / 16x conversion cycle time	
• Step: High	Yes; 32x / 64x conversion cycle time	
Encoder		
Connection of signal encoders		
 for current measurement as 2-wire transducer 	Yes	
— Burden of 2-wire transmitter, max.	650 Ω	
 for current measurement as 4-wire transducer 	Yes	
Errors/accuracies		
Linearity error (relative to input range), (+/-)	0.1 %	
Temperature error (relative to input range), (+/-)	0.023 %/K	
Repeat accuracy in steady state at 25 °C (relative to input	0.1 %	
range), (+/-)		
Operational error limit in overall temperature range		
 Current, relative to input range, (+/-) 	2 %	
Basic error limit (operational limit at 25 °C)		
• Current, relative to input range, (+/-)	0.1 %	
Interference voltage suppression for $f = n x (f1 +/- 1 \%)$, $f1 = interference frequency$		
 Series mode interference (peak value of interference < rated value of input range), min. 	40 dB	
Common mode interference, min.	70 dB	
Interrupts/diagnostics/status information		
Diagnostics function	Yes	
Alarms	100	
Diagnostic alarm	Yes	
Limit value alarm	No	
Diagnoses		
Monitoring the supply voltage	Yes	
• Wire-break	Yes	
Short-circuit	Yes	
Diagnostics indication LED		
• RUN LED	Yes; green LED	
• ERROR LED	Yes; red LED	
 Monitoring of the supply voltage (PWR-LED) 	Yes; green PWR LED	
 Channel status display 		
	Yes; green LED	
 for channel diagnostics 	Yes; red LED	
for module diagnostics	•	
-	Yes; red LED	
for module diagnostics	Yes; red LED	
for module diagnostics Potential separation	Yes; red LED	

• between the channels and backplane bus

 \bullet between the channels and the power supply of the electronics

Permissible potential difference between the inputs (UCM) 10 Vpp Isolation Isolation tested with 707 V DC (type test) Standards, approvals, certificates Highest safety class achievable in safety mode • Performance level according to ISO 13849-1 PLe • Category according to ISO 13849-1 Cat. 4 • SIL acc. to IEC 61508 SIL 3 Probability of failure (for service life of 20 years and repair time of 100 hours) - Low demand mode: PFDavg in accordance < 5.00E-05 with SIL3 - High demand/continuous mode: PFH in < 1.00E-09 1/h accordance with SIL3 Ambient conditions Ambient temperature during operation • horizontal installation, min. 0°C 60 °C • horizontal installation, max. 0°C • vertical installation, min. 50 °C • vertical installation, max. Width 15 mm Height 73 mm Depth 58 mm Weights Weight, approx. 48 g 12/28/2021 🖸 last modified:

Yes

Yes