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Data sheet 6AG2136-6CB00-1CA0



Figure similar

SIPLUS ET 200SP F-TM Count HF RAIL based on 6ES7136-6CB00-0CA0 with conformal coating OT1: -25...+55 °C ST1/2: 70 °C for 10 minutes . 1x1 Vpp sin/cos HF, PROFIsafe, 1 channel, for incremental rotary encoders, sin/cos 1 Vpp, suitable for BU type A0, pack quantity: 1 unit

General information	
Product type designation	F-TM Count 1x1Vpp sin/cos HF
Firmware version	
● FW update possible	Yes
based on	6ES7136-6CB00-0CA0
usable BaseUnits	BU type A0
Color code for module-specific color-coded label	CC01
Product function	
● I&M data	Yes; I&M0 to I&M3
Engineering with	
● STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Supply voltage	
Rated value (DC)	24 V
power supply according to NEC Class 2 required	No
Load voltage L+	
● Rated value (DC)	24 V
● permissible range, lower limit (DC)	20.4 V
● permissible range, upper limit (DC)	28.8 V
● Reverse polarity protection	Yes
Input current	
Current consumption, max.	50 mA; without load, 150 mA with 300 mA encoder load
Encoder supply	
5 V encoder supply	
● 5 V	Yes; 5.1 V ±3.5 %
● Short-circuit protection	Yes; Electronic overload protection; no protection on applying a normal or counter voltage.
● Output current, max.	300 mA
Power loss	
Power loss, typ.	1.25 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	
Automatic encoding	Yes
● Electronic coding element type H	Yes
Digital inputs	
Number of digital inputs	1; (counter input)

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Digital inputs, parameterizable	Yes
Digital input functions, parameterizable	
● Gate start/stop	Yes
● Counter for incremental encoder	Yes
— Number, max.	1
Input voltage	
● Type of input voltage	sin/cos 1 Vpp
Input delay (for rated value of input voltage)	
● Minimum pulse width for program reactions	2.5 µs
for technological functions	
— parameterizable	Yes
Cable length	
● shielded, max.	150 m
Encoder	
Connectable encoders	
● Incremental encoder (symmetrical)	Yes; up to 200 kHz depending on cable type and length
Encoder signals, incremental encoder (symmetrical)	
● Input voltage	1 Vpp, centered at 2.5 V offset
● Input frequency, max.	200 kHz
● Counting frequency, max.	800 kHz; with quadruple evaluation
● Cable length, shielded, max.	150 m
● Incremental encoder with A/B tracks, 90° phase offset	Yes; sin/cos
● Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes; sin/cos/zero
Interfaces	
Number of RS 485 interfaces	0
Interrupts/diagnostics/status information	
Diagnostics function	Yes; see chapter "Diagnostic Messages" in the manual
Alarms	
● Diagnostic alarm	Yes
● Hardware interrupt	No
Diagnoses	
● Monitoring the supply voltage	Yes
● Wire break	Yes
● Short-circuit	Yes
● A/B transition error at incremental encoder	Yes
Diagnostics indication LED	
● RUN LED	Yes; green LED
● ERROR LED	Yes; red LED
● Monitoring of the supply voltage (PWR-LED)	Yes; green LED
● Channel status display	Yes; green LED
● for channel diagnostics	Yes; red LED
● for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Counter	Yes
● Number of counters	1
● Counting frequency, max.	800 kHz; with quadruple evaluation
Safety monitoring functions	
● Safe Operating Stop (SOS)	Yes
● Safely-Limited Speed (SLS)	Yes
● Safe Direction (SDI)	Yes
● Safe Speed Monitor (SSM)	Yes
Counting functions	
● Continuous counting	Yes
● Counter response parameterizable	Yes
● Software gate	Yes
● Counting range, parameterizable	Yes
Measuring functions	
Measuring range	

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— Frequency measurement, min.	0.04 Hz
— Frequency measurement, max.	800 kHz; with quadruple evaluation
— Cycle duration measurement, min.	1 µs
— Cycle duration measurement, max.	25 s
— Velocity measurement, min.	0 (speed in configured units per selected time basis - speed*1 000)
— Velocity measurement, max.	2 147 483 (speed in configured units per selected time basis - speed*1 000)
Accuracy	
— Frequency measurement	up to 100 ppm; depending on measuring interval and signal evaluation; at low frequency external noise may have an effect on accuracy (reference the graph in 2.2.3)
— Cycle duration measurement	up to 100 ppm; depending on measuring interval and signal evaluation; at low frequency external noise may have an effect on accuracy (reference the graph in 2.2.3)
— Velocity measurement	up to 100 ppm; depending on measuring interval and signal evaluation; at low frequency external noise may have an effect on accuracy (reference the graph in 2.2.3)
Potential separation	
Potential separation channels	
● between the channels	No; Only one channel is available
● between the channels and backplane bus	Yes
● Between the channels and load voltage L+	No
● between the channels and the power supply of the electronics	No
Isolation	
Isolation tested with	750 V DC (type test) and according to EN 50155 (routine test)
Standards, approvals, certificates	
Suitable for safety functions	Yes
Ecological footprint	
● environmental product declaration	Yes
Global warming potential	
— global warming potential, (total) [CO2 eq]	88.3 kg
— global warming potential, (during production) [CO2 eq]	13.1 kg
— global warming potential, (during operation) [CO2 eq]	76.6 kg
— global warming potential, (after end of life cycle) [CO2 eq]	-1.37 kg
Highest safety class achievable in safety mode	
● Performance level according to ISO 13849-1	Cat. 4, PLe
● SIL acc. to IEC 61508	SIL 3
● SIL in accordance with EN 50126-1, 50129, 50159, 50716	SIL 2; a higher safety integrity level is possible if tested and approved for the specific application under consideration of all local regulations.
Probability of failure (for service life of 20 years and repair time of 100 hours)	
— low demand mode: PFDavg in accordance with SIL1	< 2.00E-03 signal monitoring disabled
— Low demand mode: PFDavg in accordance with SIL3	< 3.00E-05
— high demand/continuous mode: PFH in accordance with SIL1	< 3.00E-08 1/h signal monitoring disabled
— High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h
Railway application	
● EN 50121-3-2	Yes; EMC for rail vehicles
● EN 50121-4	Yes; EMC for signal and telecommunications systems
● EN 50121-5	Yes; EMC for fixed installations and railway power supply equipment
● EN 50124-1	Yes; Railway applications - overvoltage category OV2; pollution degree PD2; rated surge voltage UNi = 0.5 kV; UNm = 24 V DC
● EN 50125-1	Yes; Rail vehicles - see ambient conditions
● EN 50125-2	Yes; Stationary electrical equipment - see ambient conditions
● EN 50125-3	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 OT1, ST1/ST2, horizontal mounting position
● EN 61373	Yes; Rail vehicles - vibrations and shocks: Category 1 Class A/B

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● Fire protection acc. to EN 45545-2	Yes; For proof of conformity, see Service & Support
Ambient conditions	
Ambient temperature during operation	
● horizontal installation, min.	-25 °C; = Tmin (incl. condensation/frost)
● horizontal installation, max.	60 °C; = Tmax; +70 °C for 10 min (OT1, ST1/ST2 acc. to EN 50155); +70 °C continuously with spacing modules (6AG2193-6BN00-4BA0) or configured empty slots to the left and right of the module (OT3, ST1/ST2 acc. to EN 50155)
● vertical installation, min.	-25 °C; = Tmin
● vertical installation, max.	55 °C; = Tmax
Altitude during operation relating to sea level	
● 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)
Relative humidity	
● With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
— Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
— 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, *
— Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG1193-6AB00-0AA0)
Use on land craft, rail vehicles and special-purpose vehicles	
— 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 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *
— Against mechanical environmental conditions acc. to EN 60721-3-5	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)
— against mechanical environmental conditions in agriculture acc. to ISO 15003	Yes; Level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)
Usage in industrial process technology	
— 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)
Remark	
— 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!
Conformal coating	
● Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
● Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
● Electronic equipment on rolling stock acc. to EN 50155	Yes; class PC2 protective coating acc. to EN 50155
● Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
● Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	42 g

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Other

Note:	for use in railway applications, also observe the product information "SIPLUS extreme RAIL" A5E37661960A, Online Support article 109736776

Classifications

	Version	Classification
eClass	16	27-24-26-05
eClass	14	27-24-26-05
eClass	12	27-24-26-05
eClass	9.1	27-24-26-05
eClass	9	27-24-26-05
eClass	8	27-24-26-05
eClass	7.1	27-24-26-05
eClass	6	27-24-26-05
ETIM	10	EC001601
ETIM	9	EC001601
ETIM	8	EC001601
ETIM	7	EC001601

Approvals / Certificates

General Product Approval

Manufacturer Declaration

China RoHS

General Product Approval	EMV	Functional Saftey		Railway	Environment
		TUEV	TUEV	Confirmation	

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