



Figure similar

SIPLUS ET 200SP TM pulse 2x24V T1 rail based on 6ES7138-6DB00-0BB1 with conformal coating, -40...+60 °C, OT2 with ST1/2 (+70 °C für 10 minutes), PWM and pulse output 2 channels 2 A for proportional valves and DC motors

General information	
Product type designation	TM Pulse 2x24 V
Firmware version	
• FW update possible	Yes
based on	6ES7138-6DB00-0BB1
usable BaseUnits	BU type B1
Color code for module-specific color identification plate	CC40
Product function	
• I&M data	Yes; I&M 0
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	19.2 V
• permissible range, upper limit (DC)	28.8 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption, max.	70 mA; without load
Encoder supply	
Number of outputs	2; A common 24V encoder supply for both channels
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; per module, electronic
• Output current, max.	300 mA
Power loss	
Power loss, typ.	1.7 W
Address area	
Address space per module	
• Inputs	16 byte; 8 per channel
• Outputs	24 byte; 12 per channel
Hardware configuration	
Automatic encoding	Yes
• Mechanical coding element	Yes
• Type of mechanical coding element	type C

Digital inputs	
Number of digital inputs	2; 1 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
<ul style="list-style-type: none"> • Freely usable digital input 	Yes
<ul style="list-style-type: none"> • HW enable for digital output 	Yes
Input voltage	
<ul style="list-style-type: none"> • Type of input voltage 	DC
<ul style="list-style-type: none"> • Rated value (DC) 	24 V
<ul style="list-style-type: none"> • for signal "0" 	-5 ... +5 V
<ul style="list-style-type: none"> • for signal "1" 	+11 to +30V
<ul style="list-style-type: none"> • permissible voltage at input, min. 	-30 V; -5 V continuous, -30 V brief reverse polarity protection
<ul style="list-style-type: none"> • permissible voltage at input, max. 	30 V
Input current	
<ul style="list-style-type: none"> • for signal "1", typ. 	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Digital outputs	
Type of digital output	P- and M-switching
Number of digital outputs	2; 1 per channel
Current-sinking	Yes
Current-sourcing	Yes
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
<ul style="list-style-type: none"> • Response threshold, typ. 	6.8 A with Standard output, 2 A with High Speed output
Limitation of inductive shutdown voltage to	-0.8 V
Controlling a digital input	Yes
Accuracy of pulse duration	±100 ppm ±0.5 µs with High Speed output, ±100 ppm ±9 µs with Standard output
minimum pulse duration	1.5 µs; With High Speed output, 10 µs with Standard output
Digital output functions, parameterizable	
<ul style="list-style-type: none"> • Freely usable digital output 	Yes
<ul style="list-style-type: none"> • PWM output 	Yes
<ul style="list-style-type: none"> — Number, max. 	2; 1 per channel
<ul style="list-style-type: none"> — Cycle duration, parameterizable 	Yes; Max. 85 s
<ul style="list-style-type: none"> — ON period, min. 	0 %
<ul style="list-style-type: none"> — ON period, max. 	100 %
<ul style="list-style-type: none"> — Resolution of the duty cycle 	0.0036 %; For S7 analog format, min. 20 ns
<ul style="list-style-type: none"> • Connection of a proportional valve 	Yes
<ul style="list-style-type: none"> • Dithering 	Yes
<ul style="list-style-type: none"> — Frequency adjustable 	Yes
<ul style="list-style-type: none"> — Amplitude adjustable 	Yes
<ul style="list-style-type: none"> • Current measurement 	Yes
<ul style="list-style-type: none"> • Current control 	Yes
<ul style="list-style-type: none"> • Connection of a DC motor 	Yes
<ul style="list-style-type: none"> • ON-delay 	Yes
<ul style="list-style-type: none"> • OFF-delay 	Yes
<ul style="list-style-type: none"> • Frequency output 	Yes
<ul style="list-style-type: none"> • Pulse train 	Yes
<ul style="list-style-type: none"> • Pulse output 	Yes
Switching capacity of the outputs	
<ul style="list-style-type: none"> • with resistive load, max. 	2 A
<ul style="list-style-type: none"> • on lamp load, max. 	10 W; 1 W with High Speed output
Load resistance range	
<ul style="list-style-type: none"> • lower limit 	12 Ω; 240 ohm with High Speed output
<ul style="list-style-type: none"> • upper limit 	12 kΩ
Output voltage	

<ul style="list-style-type: none"> • Type of output voltage • for signal "0", max. • for signal "1", min. 	DC 1 V 23.2 V; L+ (-0.8 V)
Output current	
<ul style="list-style-type: none"> • for signal "1" rated value 	2 A; 0.1 A with High Speed output, observe derating
Output delay with resistive load	
<ul style="list-style-type: none"> • "0" to "1", typ. • "0" to "1", max. • "1" to "0", typ. • "1" to "0", max. 	0 µs; With High Speed output, 4.5 µs with Standard output 0.8 µs; With High Speed output, 9 µs with Standard output 0 µs; With High Speed output, 4.5 µs with Standard output 0.8 µs; With High Speed output, 9 µs with Standard output
Parallel switching of two outputs	
<ul style="list-style-type: none"> • for uprating 	Yes
Switching frequency	
<ul style="list-style-type: none"> • with resistive load, max. • with inductive load, max. • on lamp load, max. 	100 kHz; With High Speed output, 10 kHz with standard output 100 kHz; With High Speed output, 10 kHz with standard output 10 Hz
Total current of the outputs	
<ul style="list-style-type: none"> • Current per channel, max. • Current per group, max. • Current per module, max. 	2 A 4 A 4 A
Interfaces	
Number of RS 485 interfaces	0
Isochronous mode	
Bus cycle time (TDP), min.	250 µs; with 1 channel configuration, 375 µs with 2 channel configuration
Jitter, max.	1 µs; typically ±
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes; Parameterizable
Alarms	
<ul style="list-style-type: none"> • Diagnostic alarm 	Yes
Diagnoses	
<ul style="list-style-type: none"> • Monitoring the supply voltage • Short-circuit 	Yes Yes
Diagnostics indication LED	
<ul style="list-style-type: none"> • Monitoring of the supply voltage (PWR-LED) • Channel status display • for module diagnostics 	Yes; green PWR LED Yes Yes; green/red DIAG LED
Integrated Functions	
Counter	No
Potential separation	
Potential separation channels	
<ul style="list-style-type: none"> • between the channels • between the channels and backplane bus 	No Yes
Isolation	
Isolation tested with	750 V DC (type test) and according to EN 50155 (routine test)
Standards, approvals, certificates	
Suitable for safety functions	No
Railway application	
<ul style="list-style-type: none"> • EN 50121-3-2 • EN 50121-4 • EN 50121-5 • EN 50124-1 • EN 50125-1 • EN 50125-2 • EN 50125-3 • EN 50155 	Yes; EMC for rail vehicles Yes; EMC for signal and telecommunications systems Yes; EMC for fixed installations and railway power supply equipment (shielded cables required) Yes; Railway applications - overvoltage category OV2; pollution degree PD2; rated surge voltage UNi = 0.5 kV; UNm = 24 V DC 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) Yes; Rail vehicles - temperature class OT2, ST1/ST2, horizontal mounting

<ul style="list-style-type: none"> • EN 61373 • Fire protection acc. to EN 45545-2 	<p>position</p> <p>Yes; Rail vehicles - vibrations and shocks: Category 1 Class A/B</p> <p>Yes; For proof of conformity, see Service & Support</p>
Ambient conditions	
Ambient temperature during operation	
<ul style="list-style-type: none"> • horizontal installation, min. • horizontal installation, max. • vertical installation, min. • vertical installation, max. 	<p>-40 °C; = Tmin (incl. condensation/frost)</p> <p>60 °C; = Tmax; +70 °C for 10 min (OT2, ST1/ST2 acc. to EN 50155); +70 °C continuously with spacing modules (6AG2193-6BN00-4BA0) or configured slots to the left and right of the module (OT4, ST0 acc. to EN 50155)</p> <p>-40 °C; = Tmin</p> <p>50 °C; = Tmax; see Derating BasedOn (e.g. manual)</p>
Altitude during operation relating to sea level	
<ul style="list-style-type: none"> • Installation altitude above sea level, max. • Ambient air temperature-barometric pressure-altitude 	<p>2 000 m</p> <p>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)</p>
Relative humidity	
<ul style="list-style-type: none"> • With condensation, tested in accordance with IEC 60068-2-38, max. 	<p>100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation</p>
Resistance	
Coolants and lubricants	
<ul style="list-style-type: none"> — Resistant to commercially available coolants and lubricants 	<p>Yes; Incl. diesel and oil droplets in the air</p>
Use in stationary industrial systems	
<ul style="list-style-type: none"> — to biologically active substances according to EN 60721-3-3 — to chemically active substances according to EN 60721-3-3 — to mechanically active substances according to EN 60721-3-3 — Against mechanical environmental conditions acc. to EN 60721-3-3 	<p>Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request</p> <p>Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</p> <p>Yes; Class 3S4 incl. sand, dust, *</p> <p>Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)</p>
Use on land craft, rail vehicles and special-purpose vehicles	
<ul style="list-style-type: none"> — to biologically active substances according to EN 60721-3-5 — to chemically active substances according to EN 60721-3-5 — to mechanically active substances according to EN 60721-3-5 — Against mechanical environmental conditions acc. to EN 60721-3-5 — against mechanical environmental conditions in agriculture acc. to ISO 15003 	<p>Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request</p> <p>Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</p> <p>Yes; Class 5S3 incl. sand, dust; *</p> <p>Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)</p> <p>Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)</p>
Usage in industrial process technology	
<ul style="list-style-type: none"> — Against chemically active substances acc. to EN 60654-4 — Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04 	<p>Yes; Class 3 (excluding trichlorethylene)</p> <p>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)</p>
Remark	
<ul style="list-style-type: none"> — Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04 	<p>* The supplied plug covers must remain in place over the unused interfaces during operation!</p>
Conformal coating	
<ul style="list-style-type: none"> • Coatings for printed circuit board assemblies acc. to EN 61086 • Protection against fouling acc. to EN 60664-3 • Electronic equipment on rolling stock acc. to EN 50155 • Military testing according to MIL-I-46058C, Amendment 7 • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A 	<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>
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes

to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	50 g
Other	
Note:	for use in railway applications, also observe the product information "SIPLUS extreme RAIL" A5E37661960A, Online Support article 109736776

Classifications			
		Version	Classification
	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
	IDEA	4	3567
	UNSPSC	15	32-15-17-05

Approvals / Certificates

General Product Approval	Railway
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[Confirmation](#)

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