



SIMATIC S7-1500, TM count 2x 24 V counter module, 2 channels for 24 V incremental encoder or pulse encoder, 3 DI, 2 DQ per channel

General information	
Product type designation	TM Count 2x24V
Firmware version	V2.0
<ul style="list-style-type: none"> FW update possible 	Yes
Product function	
<ul style="list-style-type: none"> I&M data 	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> Isochronous mode 	Yes
Engineering with	
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated from version 	V16 with HSP 0332 / V17
<ul style="list-style-type: none"> PROFIBUS from GSD version/GSD revision 	GSD Revision 5
<ul style="list-style-type: none"> PROFINET from GSD version/GSD revision 	V2.3 / -
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
<ul style="list-style-type: none"> Rated value (DC) 	24 V
<ul style="list-style-type: none"> permissible range, lower limit (DC) 	19.2 V
<ul style="list-style-type: none"> permissible range, upper limit (DC) 	28.8 V
<ul style="list-style-type: none"> Reverse polarity protection 	Yes
Input current	
Current consumption, max.	75 mA; without load
Encoder supply	
Number of outputs	1; A common 24V encoder supply for both channels
24 V encoder supply	
<ul style="list-style-type: none"> 24 V 	Yes; L+ (-0.8 V)
<ul style="list-style-type: none"> Short-circuit protection 	Yes
<ul style="list-style-type: none"> Output current, max. 	1 A; total current of all encoders/channels
Power	
Power consumption from the backplane bus	1.3 W
Power loss	
Power loss, typ.	4 W
Address area	
Address space per module	
<ul style="list-style-type: none"> Inputs 	32 byte; 16 bytes per channel; 4 bytes for fast mode
<ul style="list-style-type: none"> Outputs 	24 byte; 12 bytes per channel; 4 bytes for Motion Control, 0 bytes for fast mode
Digital inputs	
Number of digital inputs	6; 3 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	

• Gate start/stop	Yes
• Capture	Yes
• Synchronization	Yes
• Freely usable digital input	Yes
• Probe	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• 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
for technological functions	
— parameterizable	Yes
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
• Response threshold, typ.	1 A
Limitation of inductive shutdown voltage to	L+ (-53 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "1" permissible range, max.	0.6 A; Per digital output
• for signal "1" minimum load current	2 mA
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 μs
• "1" to "0", max.	50 μs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	2 A
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Encoder	
Connectable encoders	

<ul style="list-style-type: none"> • 2-wire sensor 	Yes
<ul style="list-style-type: none"> — permissible quiescent current (2-wire sensor), max. 	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
<ul style="list-style-type: none"> • Input voltage 	24 V
<ul style="list-style-type: none"> • Input frequency, max. 	200 kHz
<ul style="list-style-type: none"> • Counting frequency, max. 	800 kHz; with quadruple evaluation
<ul style="list-style-type: none"> • Cable length, shielded, max. 	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
<ul style="list-style-type: none"> • Signal filter, parameterizable 	Yes
<ul style="list-style-type: none"> • Incremental encoder with A/B tracks, 90° phase offset 	Yes
<ul style="list-style-type: none"> • Incremental encoder with A/B tracks, 90° phase offset and zero track 	Yes
<ul style="list-style-type: none"> • pulse encoder 	Yes
<ul style="list-style-type: none"> • pulse encoder with direction 	Yes
<ul style="list-style-type: none"> • pulse encoder with one impulse signal per count direction 	Yes
Interface types	
<ul style="list-style-type: none"> • Source/sink input 	Yes
<ul style="list-style-type: none"> • Input characteristic curve in accordance with IEC 61131, type 3 	Yes
Interrupts/diagnostics/status information	
Alarms	
<ul style="list-style-type: none"> • Diagnostic alarm 	Yes
<ul style="list-style-type: none"> • Hardware interrupt 	Yes
Diagnoses	
<ul style="list-style-type: none"> • Monitoring the supply voltage 	Yes
<ul style="list-style-type: none"> • Wire-break 	Yes
<ul style="list-style-type: none"> • Short-circuit 	Yes
<ul style="list-style-type: none"> • A/B transition error at incremental encoder 	Yes
Diagnostics indication LED	
<ul style="list-style-type: none"> • RUN LED 	Yes; green LED
<ul style="list-style-type: none"> • ERROR LED 	Yes; red LED
<ul style="list-style-type: none"> • MAINT LED 	Yes; Yellow LED
<ul style="list-style-type: none"> • Monitoring of the supply voltage (PWR-LED) 	Yes; green LED
<ul style="list-style-type: none"> • Channel status display 	Yes; green LED
<ul style="list-style-type: none"> • for channel diagnostics 	Yes; red LED
Integrated Functions	
Counter	
<ul style="list-style-type: none"> • Number of counters 	2
<ul style="list-style-type: none"> • Counting frequency, max. 	800 kHz; with quadruple evaluation
Fast mode	
Yes	
Counting functions	
<ul style="list-style-type: none"> • Can be used with TO High_Speed_Counter 	Yes
<ul style="list-style-type: none"> • Continuous counting 	Yes
<ul style="list-style-type: none"> • Counter response parameterizable 	Yes
<ul style="list-style-type: none"> • Hardware gate via digital input 	Yes
<ul style="list-style-type: none"> • Software gate 	Yes
<ul style="list-style-type: none"> • Event-controlled stop 	Yes
<ul style="list-style-type: none"> • Synchronization via digital input 	Yes
<ul style="list-style-type: none"> • Counting range, parameterizable 	Yes
Comparator	
<ul style="list-style-type: none"> — Number of comparators 	2; Per channel
<ul style="list-style-type: none"> — Direction dependency 	Yes
<ul style="list-style-type: none"> — Can be changed from user program 	Yes
Position detection	
<ul style="list-style-type: none"> • Incremental acquisition 	Yes
<ul style="list-style-type: none"> • Suitable for S7-1500 Motion Control 	Yes
<ul style="list-style-type: none"> • suitable for SIMOTION 	Yes
Measuring functions	
<ul style="list-style-type: none"> • Measuring time, parameterizable 	Yes
<ul style="list-style-type: none"> • Dynamic measurement period adjustment 	Yes
<ul style="list-style-type: none"> • Number of thresholds, parameterizable 	2

Measuring range		
— Frequency measurement, min.	0.04 Hz	
— Frequency measurement, max.	800 kHz	
— Cycle duration measurement, min.	1.25 µs	
— Cycle duration measurement, max.	25 s	
Accuracy		
— Frequency measurement	100 ppm; depending on measuring interval and signal evaluation	
— Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation	
— Velocity measurement	100 ppm; depending on measuring interval and signal evaluation	
Potential separation		
Potential separation channels		
• between the channels	No	
• between the channels and backplane bus	Yes	
• Between the channels and load voltage L+	No	
Isolation		
Isolation tested with	707 V DC (type test)	
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C	
• horizontal installation, max.	60 °C; Please note derating for inductive loads	
• vertical installation, min.	-30 °C	
• vertical installation, max.	40 °C; Please note derating for inductive loads	
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual	
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	35 mm	
Height	147 mm	
Depth	129 mm	
Weights		
Weight, approx.	250 g	
Classifications		
	Version	Classification
eClass	14	27-24-22-05
eClass	12	27-24-22-05
eClass	9.1	27-24-22-05
eClass	9	27-24-22-05
eClass	8	27-24-22-05
eClass	7.1	27-24-22-05
eClass	6	27-24-22-05
ETIM	9	EC001422
ETIM	8	EC001422
ETIM	7	EC001422
IDEA	4	3567
UNSPSC	15	32-15-17-05
Approvals / Certificates		
General Product Approval	For use in hazardous locations	

[Manufacturer Declaration](#)



[CCC-Ex](#)

For use in hazardous locations

[EM](#)



[Type Examination Certificate](#)



IECEX

[Miscellaneous](#)



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[NK / Nippon Kaiji Kyokai](#)



[CCS \(China Classification Society\)](#)

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last modified:

3/12/2024