



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"> <li>FW update possible</li> </ul>	Yes
Product function	
<ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> <li>Isochronous mode</li> </ul>	Yes
Engineering with	
<ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V16 with HSP 0332 / V17
<ul style="list-style-type: none"> <li>PROFIBUS from GSD version/GSD revision</li> </ul>	GSD Revision 5
<ul style="list-style-type: none"> <li>PROFINET from GSD version/GSD revision</li> </ul>	V2.3 / -
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
<ul style="list-style-type: none"> <li>Rated value (DC)</li> </ul>	24 V
<ul style="list-style-type: none"> <li>permissible range, lower limit (DC)</li> </ul>	19.2 V
<ul style="list-style-type: none"> <li>permissible range, upper limit (DC)</li> </ul>	28.8 V
<ul style="list-style-type: none"> <li>Reverse polarity protection</li> </ul>	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"> <li>24 V</li> </ul>	Yes; L+ (-0.8 V)
<ul style="list-style-type: none"> <li>Short-circuit protection</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Output current, max.</li> </ul>	1 A; total current of all encoders/channels
Power	
Power available 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"> <li>Inputs</li> </ul>	32 byte; 16 bytes per channel; 4 bytes for fast mode
<ul style="list-style-type: none"> <li>Outputs</li> </ul>	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
<b>Input voltage</b>	
• 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
<b>Input current</b>	
• for signal "1", typ.	2.5 mA
<b>Input delay (for rated value of input voltage)</b>	
for standard inputs	
— parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
— at "0" to "1", min.	6 µs; for parameterization "none"
— at "1" to "0", min.	6 µs; for parameterization "none"
for technological functions	
— parameterizable	Yes
<b>Cable length</b>	
• shielded, max.	1 000 m
• unshielded, max.	600 m
<b>Digital outputs</b>	
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
<b>Digital output functions, parameterizable</b>	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
<b>Load resistance range</b>	
• lower limit	48 Ω
• upper limit	12 kΩ
<b>Output voltage</b>	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V)
<b>Output current</b>	
• 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
<b>Output delay with resistive load</b>	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
<b>Switching frequency</b>	
• 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
<b>Total current of the outputs</b>	
• Current per module, max.	2 A
<b>Cable length</b>	
• shielded, max.	1 000 m
• unshielded, max.	600 m

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

• Dynamic measurement period adjustment	Yes	
• Number of thresholds, parameterizable	2	
<b>Measuring range</b>		
— Frequency measurement, min.	0.04 Hz	
— Frequency measurement, max.	800 kHz	
— Cycle duration measurement, min.	1.25 µs	
— Cycle duration measurement, max.	25 s	
<b>Accuracy</b>		
— 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	
<b>Potential separation</b>		
<b>Potential separation channels</b>		
• between the channels	No	
• between the channels and backplane bus	Yes	
• Between the channels and load voltage L+	No	
<b>Isolation</b>		
Isolation tested with	707 V DC (type test)	
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• 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	
<b>Altitude during operation relating to sea level</b>		
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200MP system manual	
<b>Decentralized operation</b>		
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	
<b>Dimensions</b>		
Width	35 mm	
Height	147 mm	
Depth	129 mm	
<b>Weights</b>		
Weight, approx.	250 g	
<b>Classifications</b>		
	<b>Version</b>	<b>Classification</b>
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
<b>Approvals / Certificates</b>		
<b>General Product Approval</b>	<b>For use in hazardous locations</b>	

[Manufacturer Declaration](#)



[CCC-Ex](#)

For use in hazardous locations

Marine / Shipping

[EM](#)



[Type Examination Certificate](#)



IECEX

[Miscellaneous](#)



ABS

Marine / Shipping



LRS

[NK / Nippon Kaiji Kyokai](#)



RINA

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

Marine / Shipping



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