

SIMATIC S7-1500, TM COUNT 2X24V COUNTING MODULE, 2 CHANNELS FOR 24V INCREMENTAL ENCODER OR 24V PULSES, 3DI, 2DQ PER CHANNEL



## General information

Product type designation	TM Count 2x24V
Product function	
<ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>	Yes; I&M 0
Engineering with	
<ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated as of version</li> </ul>	V12 / V12
<ul style="list-style-type: none"> <li>STEP 7 configurable/integrated as of version</li> </ul>	V5.5 SP3 / -
<ul style="list-style-type: none"> <li>PROFINET as of GSD version/GSD revision</li> </ul>	V2.3 / -

## Installation type/mounting

Rail mounting possible	Yes; S7-1500 mounting rail
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## 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	
Occupied address area	
<ul style="list-style-type: none"> <li>• Inputs</li> </ul>	16 byte; Per channel
<ul style="list-style-type: none"> <li>• Outputs</li> </ul>	12 byte; per channel; 4 bytes for Motion Control
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	
<ul style="list-style-type: none"> <li>• Gate start/stop</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Capture</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Synchronization</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Freely usable digital input</li> </ul>	Yes
Input voltage	
<ul style="list-style-type: none"> <li>• Type of input voltage</li> </ul>	DC
<ul style="list-style-type: none"> <li>• Rated value (DC)</li> </ul>	24 V
<ul style="list-style-type: none"> <li>• for signal "0"</li> </ul>	-30 to +5V
<ul style="list-style-type: none"> <li>• for signal "1"</li> </ul>	+11 to +30V
<ul style="list-style-type: none"> <li>• permissible voltage at input, min.</li> </ul>	-30 V
<ul style="list-style-type: none"> <li>• permissible voltage at input, max.</li> </ul>	30 V
Input current	
<ul style="list-style-type: none"> <li>• for signal "1", typ.</li> </ul>	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
— at "0" to "1", min.	6 µs; for parameterization "none"
— at "1" to "0", min.	6 µs; for parameterization "none"

for counter/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+ (-33 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               <ul style="list-style-type: none"> <li>— permissible quiescent current (2-wire sensor), max.</li> </ul> </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
Encoder signal 24 V	
<ul style="list-style-type: none"> <li>— permissible voltage at input, min.</li> <li>— permissible voltage at input, max.</li> </ul>	-30 V 30 V
Interface types	
<ul style="list-style-type: none"> <li>• Input characteristic curve in accordance with IEC 61131, type 3</li> <li>• Source/sink input</li> </ul>	Yes Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Filtering and processing time (TCI), min.	130 µs
Bus cycle time (TDP), min.	250 µs
Interrupts/diagnostics/status information	
Alarms	
<ul style="list-style-type: none"> <li>• Diagnostic alarm</li> <li>• Hardware interrupt</li> </ul>	Yes Yes
Diagnostic messages	
<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	

• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• Status indicator backward counting (green)	Yes
• Status indicator forward counting (green)	Yes

## Integrated Functions

Number of counters	2
Counting frequency (counter) max.	800 kHz; with quadruple evaluation
<b>Counting functions</b>	
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
<b>Comparator</b>	
— Number of comparators	2; Per channel
— Direction dependency	Yes
— Can be changed from user program	Yes
<b>Position detection</b>	
• Incremental acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
<b>Measuring functions</b>	
• Measuring time, parameterizable	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 $\mu$ s
— 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>	
Potential separation channels	

- between the channels
- between the channels and backplane bus
- Between the channels and load voltage L+

No  
Yes  
No

### Isolation

Isolation tested with 707 V DC (type test)

### Ambient conditions

#### Ambient temperature during operation

- horizontal installation, min. 0 °C
- horizontal installation, max. 60 °C; Please note derating for inductive loads
- vertical installation, min. 0 °C
- vertical installation, max. 40 °C; Please note derating for inductive loads

### Decentralized operation

to SIMATIC S7-1500 Yes  
to standard PROFINET controller Yes

### Dimensions

Width 35 mm  
Height 147 mm  
Depth 129 mm

### Weights

Weight, approx. 250 g

**last modified:** 12/06/2016