

SIMATIC S7-1500, TM count 2x24V Counter module, 2 channels for 24 V incremental or encoder 3 DI, 2 DQ per channel



General information	
Product type designation	TM Count 2x24V
Firmware version	V1.3
<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>	V12 (FW V1.0) ... V15 (FW V1.3)/V12 (FW V1.0), V13 (FW V1.1)
<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> <li>• Reverse polarity protection</li> </ul>	28.8 V Yes
<b>Input current</b>	
Current consumption, max.	75 mA; without load
<b>Encoder supply</b>	
Number of outputs	1; A common 24V encoder supply for both channels
<b>24 V encoder supply</b>	
<ul style="list-style-type: none"> <li>• 24 V</li> <li>• Short-circuit protection</li> <li>• Output current, max.</li> </ul>	Yes; L+ (-0.8 V) Yes 1 A; total current of all encoders/channels
<b>Power</b>	
Power available from the backplane bus	1.3 W
<b>Power loss</b>	
Power loss, typ.	4 W
<b>Address area</b>	
Address space per module	
<ul style="list-style-type: none"> <li>• Inputs</li> <li>• Outputs</li> </ul>	16 byte; Per channel 12 byte; per channel; 4 bytes for Motion Control
<b>Digital inputs</b>	
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> <li>• Capture</li> <li>• Synchronization</li> <li>• Freely usable digital input</li> </ul>	Yes Yes Yes Yes
<b>Input voltage</b>	
<ul style="list-style-type: none"> <li>• Type of input voltage</li> <li>• Rated value (DC)</li> <li>• for signal "0"</li> <li>• for signal "1"</li> <li>• permissible voltage at input, min.</li> <li>• permissible voltage at input, max.</li> </ul>	DC 24 V -5 ... +5 V +11 to +30V -30 V; -5 V continuous, -30 V brief reverse polarity protection 30 V
<b>Input current</b>	
<ul style="list-style-type: none"> <li>• for signal "1", typ.</li> </ul>	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
Cable length	
• 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
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

• 2-wire sensor	Yes
— permissible quiescent current (2-wire sensor), max.	1.5 mA

### Encoder signals, incremental encoder (asymmetrical)

• Input voltage	24 V
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes

### Encoder signal 24 V

— permissible voltage at input, min.	-30 V
— permissible voltage at input, max.	30 V

### Interface types

• Source/sink input	Yes
• Input characteristic curve in accordance with IEC 61131, type 3	Yes

## Isochronous mode

Filtering and processing time (TCI), min.	130 µs
Bus cycle time (TDP), min.	250 µs

## Interrupts/diagnostics/status information

### Alarms

• Diagnostic alarm	Yes
• Hardware interrupt	Yes

### Diagnostic messages

• 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
• 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 forward counting (green)	Yes
• Status indicator backward counting (green)	Yes

### Integrated Functions

Number of counters	2
Counting frequency (counter) max.	800 kHz; with quadruple evaluation
<b>Counting functions</b>	
• Can be used with TO High_Speed_Counter	Yes
• 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 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

### 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.	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 S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes; FW V1.1 and higher
to standard PROFINET controller	Yes

Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm

Weights	
Weight, approx.	250 g
<b>last modified:</b>	06/22/2020