

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"> 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 	V12 (FW V1.0) ... V15 (FW V1.3)/V12 (FW V1.0), V13 (FW V1.1)
<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) • Reverse polarity protection 	28.8 V 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 • Short-circuit protection • Output current, max. 	Yes; L+ (-0.8 V) Yes 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"> • Inputs • Outputs 	16 byte; Per channel 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"> • Gate start/stop • Capture • Synchronization • Freely usable digital input 	Yes Yes Yes Yes
Input voltage	
<ul style="list-style-type: none"> • Type of input voltage • Rated value (DC) • for signal "0" • for signal "1" • permissible voltage at input, min. • permissible voltage at input, max. 	DC 24 V -5 ... +5 V +11 to +30V -30 V; -5 V continuous, -30 V brief reverse polarity protection 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

— 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
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+ (-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

Diagnoses

- 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
Counting functions	
• 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
Comparator	
— Number of comparators	2; Per channel
— Direction dependency	Yes
— Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
Measuring range	
— Frequency measurement, min.	0.04 Hz
— Frequency measurement, max.	800 kHz
— Cycle duration measurement, min.	1.25 μ s
— 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.	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
last modified:	09/03/2020