



SIMATIC S7-1500, TM count 2x24 V 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
FW update possible	Yes
Product function	
I&M data	Yes; I&M0 to I&M3
Isochronous mode	Yes
Engineering with	
STEP 7 TIA Portal configurable/integrated from version	V12 (FW V1.0) ... V15 (FW V1.3)/V12 (FW V1.0), V13 (FW V1.1)
PROFIBUS from GSD version/GSD revision	GSD Revision 5
PROFINET from GSD version/GSD revision	V2.3 / -
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
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	
24 V	Yes; L+ (-0.8 V)
Short-circuit protection	Yes
Output current, max.	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	
Inputs	16 byte; Per channel
Outputs	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,	Yes

type 3	
Digital input functions, parameterizable	
• Gate start/stop	Yes
• Capture	Yes
• Synchronization	Yes
• Freely usable digital input	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
— 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 — permissible quiescent current (2-wire sensor), max.	Yes 1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage • Input frequency, max. • Counting frequency, max. • Cable length, shielded, max. • Signal filter, parameterizable • Incremental encoder with A/B tracks, 90° phase offset • Incremental encoder with A/B tracks, 90° phase offset and zero track • pulse encoder • pulse encoder with direction • pulse encoder with one impulse signal per count direction	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	
• Source/sink input • Input characteristic curve in accordance with IEC 61131, type 3	Yes 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 • Hardware interrupt	Yes Yes
Diagnoses	
• Monitoring the supply voltage • Wire-break • Short-circuit • A/B transition error at incremental encoder	Yes Yes Yes Yes
Diagnostics indication LED	
• RUN LED • ERROR LED • MAINT LED • Monitoring of the supply voltage (PWR-LED) • Channel status display • for channel diagnostics • Status indicator forward counting (green) • Status indicator backward counting (green)	Yes; green LED Yes; red LED Yes; Yellow LED Yes; green LED Yes; green LED Yes; red LED Yes Yes
Integrated Functions	
Counter	
• Number of counters • Counting frequency, max.	Yes 2 800 kHz; with quadruple evaluation
Counting functions	
• Can be used with TO High_Speed_Counter • Continuous counting • Counter response parameterizable • Hardware gate via digital input • Software gate • Event-controlled stop • Synchronization via digital input • Counting range, parameterizable	Yes Yes Yes Yes Yes Yes Yes Yes
Comparator	
— Number of comparators — Direction dependency — Can be changed from user program	2; Per channel Yes Yes
Position detection	
• Incremental acquisition • Suitable for S7-1500 Motion Control	Yes 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 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.	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
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; 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
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