

Schneider Series Service Manual

TSXCAY41

1. Description

The TSXCAY41 from Schneider Electric is designed for specific motion control applications for servo motors. It includes several voltage inputs and has a power dissipation range of 10 to 17 watts, allowing efficient energy management.

2. Specifications

Specification	Value
Manufacturer	Schneider Electric
Product	Type Motion control modules
Product	Line TSX Micro PLCs
Part	Number TSXCAY41
EAN	3389110726121
Weight	1.00 lbs (0.45 kg)
Input	Voltage 24 V 8 mA auxiliary input, 24 V 8 mA servo drive control input, 5 V 18 mA counter input
Power	Dissipation 10 to 17 W
Clock	Frequency 200 kHz SSI absolute encoder, Incremental encoder frequency x1 500 kHz, Incremental encoder frequency x4 1000 kHz in counting, 250 kHz in input
Input	Compatibility Absolute encoder SSI output 16...25 bits, Incremental encoder 10...30 V totem pole, Incremental encoder 5 V DC RS422
I/O	Modularity 4 axes
Type	of Axis Following axis static ratio, Limited axis
Operating	Modes Automatic, OFF, Direct drive mode, FOLLOWER, Manual
Range	of Product Modicon Premium Automation platform
Application	For servo motors
Servo	Loop Type Proportional to overshoot compensation and gain switching
Speed	Profile Path Trapezoidal or parabolic
Resolution	0.5 to 1000 position units per point
Acquisition	Speed

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Technical specifications for TSXCAY41

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Operating Modes Automatic, OFF, Direct drive mode, FOLLOWER, Manual

Range of Product Modicon Premium Automation platform

Application For servo motors

Servo Loop Type Proportional to overshoot compensation and gain switching

Speed Profile Path Trapezoidal or parabolic

Resolution 0.5 to 1000 position units per point

Acquisition Speed 54,000 to 270,000 points per minute

Acceleration Time 8 ms to 10 s

Range of Product

Modicon Premium Automation platform

Product or Component Type

Motion control modules

Product Specific Application

For servo motors

Servo loop type

Proportional to overshoot compensation and gain switching 4 ms

Checks

Presence of voltage/sensor feedback counter input

Consistency of commands

Encoder coupling, servo drive present, emergency stop

Proper execution of movement

Sensor power supply

Validity of parameters

Complementary

Speed profile path

Trapezoidal or parabolic

Resolution

>= 0.5 position units per point

<= 1000 position units per point

Length of axis

32000...32000000 P

Acquisition speed

<= 270000 points/mn

>= 54000 points/mn

Acceleration time

8 ms...10 s

Operating Mode

Automatic

OFF

Direct drive mode

FOLLOWER

Manual

Type of axis

Following axis static ratio

Limited axis

I/O modularity

4 axes

Input compatibility

Absolute encoder SSI output 16...25 bits

Incremental encoder 10...30 V totem pole

Incremental encoder 5 V DC RS422

With 2-wire/3-wire sensor (24 DC) auxiliary input

Absolute encoder parallel output ABE7CPA11

Clock frequency

200 kHz SSI absolute encoder

Incremental encoder frequency x1

500 kHz

Incremental encoder frequency x 4

1000 kHz in counting

250 kHz in input

Power dissipation in W

10...17 W

Input type

Current sink auxiliary input EN/IEC 1131 Type 2

Resistive servo drive control input EN/IEC 1131 Type 1

Resistive counter input

Input logic

Positive

Input voltage

24 V 8 mA auxiliary input

24 V 8 mA servo drive control input

5 V 18 mA counter input

Input voltage limits

≤ 5.5 V counter input

19...30 V auxiliary input

19...30 V servo drive control input

Voltage state 1 guaranteed

≥ 11 V auxiliary input

≥ 11 V servo drive control input

≥ 2.4 V counter input

Current state 1 guaranteed

≥ 3.5 mA servo drive control input)

≥ 3.7 mA counter input)

≥ 6 mA auxiliary input)

Voltage state 0 guaranteed

≤ 1.2 V counter input

≤ 5 V auxiliary input

≤ 5 V servo drive control input

Current state 0 guaranteed

≤ 1 mA counter input)

≤ 1.5 mA servo drive control input)

≤ 2 mA auxiliary input)

Input impedance

270 Ohm counter input

3000 Ohm auxiliary input

3000 Ohm servo drive control input

Number of outputs

4 reflex output static EN/IEC 61131

4 analogue output static

4 servo drive validation output relay

Analogue output range

+/- 10...24 V

Analogue output resolution

13 bits + sign

LSB value

1.25 mV analogue output

Output voltage

24 V DC reflex output:

24 V DC servo drive validation output:

Output voltage limits

Reflex output 19...30 V

Servo drive validation output 5...30 V

Nominal output current

0.5 A reflex output

Maximum output current

1.5 mA analogue output

200 mA servo drive validation output

625 mA reflex output

Minimum load

1 mA 1 V

Maximum voltage drop

<1 V at state on reflex output

Maximum leakage current

0.3 mA reflex output

Switching time

< 5 ms for servo drive validation

< 500 µs for reflex output

Output compatibility

Positive logic DC inputs (resistance ≤ 15 kOhm) reflex

Short-circuit protection

Current limiter reflex output

Thermal tripping reflex output

Output overload protection

Current limiter reflex output

Thermal tripping reflex output

Output overvoltage protection

Zener diode between outputs and 24 DC reflex output

Reverse polarity protection

Reflex output reverse diode on supply

Local signalling

1 LED (green) for module operating (RUN)

1 LED (red) for external fault (I/O)

1 LED (red) for internal fault, module failure (ERR)

4 LEDs (green) for axis diagnostics available

Electrical connection

1 connector HE-10 20 pins for servo drive ctrl inputs + for ext power supply of servo drive inputs/outputs

3 connectors HE-10 20 pins for aux inputs, reflex output, for external sensor and preactuator power supply

1 connector SUB-D 9 for an analogue output (speed reference)

4 connectors SUB-D 15 for an incremental or absolute encoder

Current consumption

22...40 mA 24 V DC on 10/30 V absolute encoder module

1500 mA 5 V DC

30 mA 24 V DC

Module format

Double

Net Weight

1.34 lb(US) (0.61 kg)

Environment

Protective treatment

TC

Ambient Air Temperature for Operation

32...140 °F (0...60 °C)

Ambient Air Temperature for Storage

-13...158 °F (-25...70 °C)

Relative Humidity

5...95 % without condensation

Operating altitude

<= 6561.68 ft (2000 m)

Ordering and shipping details

Category

US1PC2222558

Discount Schedule

PC22

GTIN

3389110726121

Returnability

No

Packing Units

Unit Type of Package 1

PCE

Nbr. of units in pkg.

1

Package 1 Height

3.7 in (9.5 cm)

Package 1 Width

7.09 in (18.0 cm)

Package 1 Length

10.2 in (26.0 cm)

Package weight(Lbs)

31.2 oz (884.0 g)

Description

The Schneider Electric TSXCAY41 is a motion control module integrating servo motor functionalities. Multiple input voltages are supported, including 24 V auxiliary and servo drive control, along with a 5 V counter input. The device dissipates power within 10 to 17 watts, ensuring adequate performance with efficient energy use.

This module uses clock frequencies that vary according to application needs. The SSI absolute encoder operates at 200 kHz, while incremental encoders can function at frequencies of up to 1000 kHz, depending on the counting method employed. The device supports compatibility with absolute encoders that output between 16 to 25 bits and incremental encoders that operate on 10 to 30 V and 5 V DC signals.

I/O modularity accommodates up to four axes, providing enhanced control over motion dynamics, whether supporting static or limited axes. Operating modes range from automatic and manual to direct drive modes, facilitating diverse applications tailored to project requirements. The module belongs to the Modicon Premium Automation platform, enhancing its versatility in industrial scenarios.

The TSXCAY41 employs a proportional servo loop for efficient motion handling, integrating overshoot compensation and gain switching for optimal performance. Users can define their motion path profile, choosing between trapezoidal or parabolic implementations. Enhanced positioning resolution ranges from 0.5 to 1000 position units per point. The system achieves an acquisition speed between 54,000 and 270,000 points per minute, ensuring prompt data handling. Moreover, users can adjust acceleration times from as quick as 8 milliseconds to 10 seconds, adapting to various operational scenarios.