



Subject: Application Overview	Product: MP2600iec, Sigma-5, SGMCS Direct Drive motor, MotionWorks IEC	Doc#: AO.MCD.05.111
Title: Rotary Table Indexer		

Rotary Table Indexer

Application Overview

Rotary table indexers position a rotary table, also known as a dial plate, to a specific location so that some type of process can be executed. Examples of these processes include: removing product from the rotary table, packaging/inspecting the product and placing a label on the product. Rotary tables are used across a wide range of industries, from packaging to assembly. Rotary tables can be driven through a gearbox or directly via a direct drive motor.

Application Challenges

- Absolute Position Management – Controller must translate encoder data to identify absolute position around the rotary table. Many rotary table applications prefer to avoid any type of homing procedure upon power up.
- Positioning w/out Gearbox (DD motor) – High-accuracy applications can benefit from removal of the gearbox and any associated backlash. However, the Inertia Ratio between the load and servo motor will higher, requiring unique motor characteristics and performance capability.
- Increased throughput – Control must suppress vibrations and minimize settling time to maximize operation time and throughput.
- Smooth Motion – The solution must yield smooth motion to reduce machine wear produced by jerky accelerations, resulting in increased machine life and lower maintenance (more uptime).

Yaskawa Products:

Product	Feature	Benefit
Sigma-5	High-torque density Sigma-5 servomotors	Faster cycle times with a more power in a smaller sized motor allow for higher performance and throughput in the same or smaller space.
	SGDV Sigma-5 Servo amplifier frequency response of 1.6kHz	Dual notch filters, anti-resonance, and vibration-suppression filters allow stable performance with high gain.
MP2600iec	1-axis control mounted to the side of the Sigma-5 servopack	Simplified machine sequencing and enhanced machine coordination in a small package.





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	EtherNet/IP, Ethernet ModbusTCP Communications	Easy transfer of servo data to a supervisory PLC or MES data collection system.
MotionWorks IEC Pro	IEC61131-3 Global Standard Programming Environment	Reduced learning curve of standard machine languages results in faster machine commissioning. User libraries of reusable code can be easily imported into new projects, saving time and speeding the build cycle.
PLCopen Toolbox	Pre-written library that provides essential functions for Rotary Table control.	Importable user library allows easy on-the-fly adjustments to all motion profiles. Absolute ©moves can be forced positive, negative, or by shortest path.

Application Solution and Benefits

Application Solution Benefits with Standard Sigma-5 Servomotor

Absolute Encoder Integration

This is the first, and most important step. Data from the absolute encoder is automatically handled by the controller so absolute position can be maintained through power loss. The maximum number of turns on the absolute encoder can be programmed to match the gear ratio so that the system position will always remain within the 360 degree output cycle.

Absolute Revolution Position

Station locations can be easily calculated around the 360 deg cycle. Absolute moves can be made to each station by means of positive direction, negative direction, or shortest path.

Application Solution Benefits with Direct Drive Motor

Higher Positioning Accuracy

The SGMCS series Direct Drive Motor has an integral single-turn 20-bit absolute encoder. When connected directly to the load, the motor provides positioning resolution to 0.000343 deg (1.236 arc-sec) with zero backlash.

