

HARDWARE

VS.

SOFTWARE

Industrial Motion Control

COST & PERFORMANCE COMPARED

Can software-based motion control compete with the traditional hardware approach?

LET'S FIND OUT



THE SCENARIO

An OEM produces a machine controller that requires 8 axes of servo motion control

THE TRADITIONAL APPROACH

THE ALTERNATIVE APPROACH

HARDWARE

SOFTWARE

{ KINGSTAR Soft Motion }

THE SET-UP

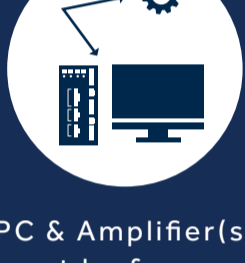
THE SET-UP

- Commercial-Grade PC
- DSP-based Board
- Breakout Panel & Cable
- Software & Library Provided By Hardware Vendor
- Encoder Cables
- Control Cables
- Hall Effect Cables
- Motor Cables
- Power Cables

- Industrial-Grade PC
- Real-time Operating System, like RTX64
- EtherCAT Cables
- Encoder Cables
- Hall Effect Cables
- Motor Cables
- Power Cables

THE SITUATION

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Limited number of axes controlled per DSP board

PC & Amplifier(s) must be far away from motors



Crowded and complex cabling or need for breakout board

Tedious and error-prone cable attachments



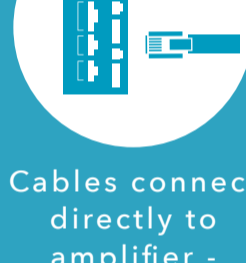
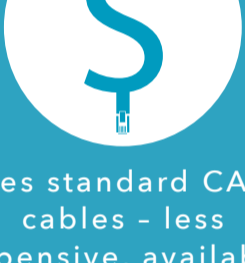
Very long and very expensive cables

Vendor lock-in



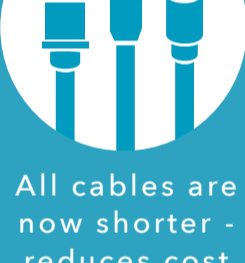
Control unlimited number of axes

Ability to mount amplifiers close to motors



Uses standard CAT5 cables - less expensive, available in any length

Cables connect directly to amplifier - minimizes error



All cables are now shorter - reduces cost

Digital signals instead of analog output

THE BREAKDOWN

COSTS COMPARED

HARDWARE (DSP BOARD)		SOFTWARE (KINGSTAR Soft Motion)	
ITEM	COST	COST	ITEM
DSP Board	\$1,500	\$500	KINGSTAR Soft Motion
Analog (5ft long)	\$400	\$320	Encoder (4ft Avg.)
Encoder (11ft Avg.)	\$920	\$320	Halls (4ft Avg.)
Halls (11.5ft Avg.)	\$920	\$640	Motor Power (4ft Avg.)
Motor Power (11.5ft Avg.)	\$1,840	\$80	CAT5 Cables
		\$600	Amplifier EtherCAT Interface
	\$5,580	\$2,460	

Control Cables (\$/ft)	\$10	Motor Cables (\$/ft)	\$20	CAT5 Cables (\$ ea)	\$10
DSP Board (\$ per board)	\$1,500	Avg. DSP Length (ft)	11.5'	Axes	8
KINGSTAR (\$ per machine)	\$500	EtherCAT Interface (\$ per AMP)	\$75	Min EtherCAT Length (ft)	4'

PERFORMANCE COMPARED

HARDWARE

SOFTWARE

{ KINGSTAR Soft Motion }

PERFORMANCE QUALITY	✓	✓
COMPLEXITY OF CALCULATIONS	✓	✓
UPDATE RATES	✓	✓
UPGRADES		✓
TIME-TO-MARKET		✓
FLEXIBILITY		✓
AGILITY		✓
SCALABILITY		✓
"PLUG-AND-PLAY" CAPABILITY		✓

THE RESULTS

SOFTWARE

reduces the DSP-based hardware cost by

56%



KINGSTAR

SoftMotion

KINGSTAR.COM