Distributed-Centralized Control

Complete Motion-Control System in the Palm of your Hand

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Quartet







Distributed-Centralized Control

Not an Oxymoron! A new and advantageous control scheme with:

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Centralized approach – high performing multi-axis control Distributed qualities – high precision servo control Out of cabinet installation – miniature yet ultra powerful

So, who needs this?



Small to large size companies are creating innovative robotics in all sectors



Source: CB Insights

Traditional 4-Axis Control System

Any company looking to create innovative robotics is either developing their own, or at least using industry standard robotics

If an application is set to use a SCARA robot, the plug-and-play simplicity is countered with large centralized controllers, cabinets, and cooling elements.



Traditional 4-Axis Control System

What about a company developing its own 4-axis system?

The company would have to integrate:

- 4 servo systems with feedback and motor control
- Multi-axis controller for motion coordination
- fieldbus architecture
- Safety

Much expertise is needed ensure proper integration and interoperation off all components in system



a complex task for any young, or experienced company looking to excel in a fast paced market.

4-Axis Control Systems – traditional options



4-Axis Control Systems

Centralized

Pro

- Minimal latency
- High performing multiaxis control and profiling
- Simple physical implementation

Con

- Simple servo (low performing current loops, vector control, etc.)
- commanded relayed internally via analog

Distributed

Pro

 Dedicated high performance servo control - better servo loops and torque generation

Con

- Motor and feedback data has to travel between drive and controller, depending on fieldbus
- Typically higher cost, and more complex implementations

Distributed & Discrete

Pro

- Same as distributed
- & Drives mounted near load - saves on cabling, carriers, and cabinet size

Con

 Motor and feedback data has to travel between drive and controller, depending on fieldbus

Distributed-Centralized Control (DCC)



The best of all worlds

- Centralized approach: High performing multi-axis control and profiling, with minimal latency
- Distributed servoperformance: Dedicated high performance servo control better servo loops and torque generation
- Out of cabinet: complete module mounted near the load, saving on cabling, cable carriers, and electrical cabinet

Distributed-Centralized Control (DCC)





- 12VDC- 100VDC
- 12VDC- 200VDC
- Output current range:
 - Up to 25A- 30A continuous
 - Up to 50A- 60A peak

- Miniature 4-Axis Module
 - (or part of EtherCAT network)
- Complete Motion Control System
- Coordinated multi-axis motion
- High precision servo control
- Functional Safety Support (IEC 61800-5-2)
- Rich I/O support
- Single programming interface
- Efficient, low consuming processing



Application possibilities







Robotics - Delta, SCARA, Gantry SMT pick & place mounting heads



Gimbals and Pods



AGV and mobile robotics

Application Possibilities | Robotics

- 4 axes robotics can be operated with one module
- Module processing is powerful enough to handle the kinematics of SCARA, Delta, Gantry, and Cartesian robots









Robotics - Delta, SCARA, Gantry



Application Possibilities | SMT Pick & Place Mounting Heads

- 16 mounting head axes
- 4 axes per module $(2x Z, \theta)$
- Multi-axis module are mounted on the moving load
 - Saves on cabling and cable carriers
- High precision servo drives in each allows for sensor-less force control (0.3N – 10N)
- Modules communicate between each another over EtherCAT





SMT pick & place mounting heads

Application Possibilities | Gimbals and Pods







Application Possibilities | AGV and Mobile Robots



Integrated Safety



Functional Safety + FSoE (over EtherCAT) IEC 61800-5-2

Safety Feedback dual absolute encoder support

Safety I/O SIL-3 PL-e, Safe brake output







In compliance with:

SIL-3: (IEC-61800-5-2, Functional safety of electrical safety related systems) IEC-61800-5-2 Adjustable speed electrical power drive systems)

PL-e, CAT-4: (ISO 13849, Safety of machinery, safety related parts of control systems)

*certification pending

Coding Simplicity

MATLAB / C code can run on the real time hardware by a simple click of a button, controlling all 4 axes







Complete Motion Control System

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Distributed-Centralized Control

The best of all worlds.

Multi-axis, high-power, safety integrated solution is operated by simple programming, and can simplify system design, cut costs, create space-saving, and reduce time-to-market.

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Visit us at booth #118



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