7 Compelling Reasons to Design using Actuators with Integrated Servo Drives

Harmonic Drive® Actuators with Integrated Servo Drive Technology (IDT) simplifies cable management, control hardware and commissioning while achieving outstanding performance in a compact size. These actuators enable engineers to choose a proven solution to create slim designs while mitigating concerns of cable failures, large control boxes and selection of servo drives that require installation and commissioning. Harmonic Drive® IDT actuators are available in eight different sizes and configurations from size 5 with 1.4 Nm to size 32 with 477 Nm of torque. EtherCAT® will also be available soon!

1 Simplified Cable Management

- Conventional systems with connections to external servo drives consist of a motor power cable and a feedback cable from each actuator, typically with large diameters, causing difficulty in routing to the servo drive in the control box
- A six-axis robot would require 6 power cables and 6 feedback cables to connect to 6 servo drives with up to 90 connections
- Multiple Harmonic Drive® IDT actuators connect to a common bus with only a single cable of 4 conductors (+VDC, 0VDC, CANH, and CANL)

2 Simple Control Hardware

- External servo drives require a large control box with proper spacing between each servo drive
- Harmonic Drive® IDT actuators do not require external servo drives, enabling small control boxes
- IDT actuators also enable simple scalability when adding an actuator to the system – no need to increase the size of the control box

3 Ideal Solution for Mobile Robots

- Harmonic Drive® IDT are especially beneficial for autonomous systems like AGVs that operate with batteries
- Battery life is improved with an overall system weight reduction
- Space is conserved as no external servo drives are required

4 Compact Actuator Design

- Typical integrated actuators or motors include large housings added radially or axially to include the servo drive
- Harmonic Drive® IDT actuators have maintained the overall size and shape of the same actuators without servo drives for most with a maximum axial length increase of only 3mm
- SHA IDT actuators have a large hollow shaft to pass cables through

5 Easy Commissioning

- Typical servo drives require motor parameters and feedback settings to be entered before enabling and tuning the servo
- Harmonic Drive® IDT actuators are factory configured with the appropriate settings
- Plug and play operation – once connected to the CAN bus, the actuator is recognized and ready to operate
- Little to no servo tuning is typically required
- HDL-IDE software allows for additional tuning and frequency response analysis with Bode Plots and Step Response features

6 Exceptional Functionality and Performance

- Zero Backlash Harmonic Drive® gearing provides exceptional accuracy and torque density
- Robust output bearing can support large loads
- CANopen® communication certified to CiA DS402 and DS301 with up to 127 nodes on a single bus
- Dual absolute encoders for FHA-Mini and SHA provides position data within one revolution of the output without the need for a battery
- I/O option for 2 Digital Inputs and 2 programmable Analog/Digital Inputs or Outputs for CANopen addressable remote I/O
- Modes of operation – Position, Velocity, Torque (CST), CSP, CSV

7 Very Economical

- Conventional systems include costs for motor power and feedback cables as well as external servo drives
- It is time consuming to evaluate a path to pass cables through the system and make up to 15 connections per actuator
- Harmonic Drive® IDT actuators simplify cable routing and only requires connecting 4 conductors to the control box for the entire system, saving substantial installation time
- There is a considerable cost savings compared to a conventional system with only a single cable necessary and servo drives already included in the actuator

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Call to learn more 800.921.3332 or visit us at HarmonicDrive.net