

The Ideal High Current Compact Drive for any AGV (Automated Guided Vehicle) application

Elmo Ultra High Current Servo Drives provide superior performance, with only two days development

The Background

The company WFT produces modular platforms used to transport heavy loads such as industrial equipment, wind turbines and other large machinery. Headquartered in Germany, the company was established over a decade ago.

WFT's Modular Individual Transport System (M.I.T. WFT) enables unrestricted mobility for heavy vehicles which can carry loads of up to 500 tons. The M.I.T. WFT system moves loads at very low heights, with a maximum vehicle height of 320 mm. The vehicle is designed to easily overcome common obstacles, like factory hall entrance sills. Each M.I.T. WFT system is equipped with a minimum of four pairs of wheels, two wheels at each corner.

The Challenge

As an experienced innovator, WFT is committed to providing customers with the most advanced transport vehicles, unrestricted mobility and smooth, precise motion for extreme heavy loads.

The WFT M.I.T. requires eight servo drives supplying high current for periods as long as several minutes, with high level precision, smooth motion when carrying sensitive heavy loads, compactness, and easily interfacing with their PLC via CANopen.

Since each wheel is equipped with a servo motor, WFT required a controller to synchronize all axes in real time with a high degree of precision.



Elmo was put to the test, to supply a servo drive that:

- ▶ Provides smooth motion when carrying sensitive heavy loads
- ▶ Sustains highest levels of current for extended periods
- ▶ Tailored to the limited space available for servo drives in the vehicle
- ▶ Provides the required precision

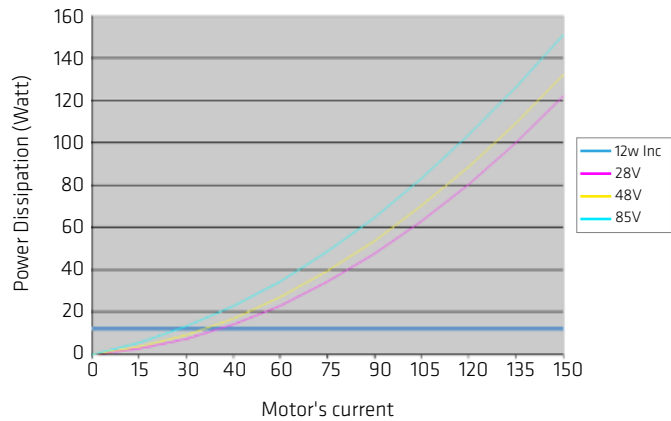
The Solution

One of the range of Elmo Motion Control's "Smart Small and Simple" (& Green) Technology servo drives is the ideal solution to meet the customer's requirements. **The Ultra High Current servo drive, the G-DRUR150 - The ultimate solution.**

With 150A output current in a super compact package, operating voltage of up to 96 VDC, using Elmo's advance control algorithm, a top efficiency of >99%, and a rugged design, Elmo matched customer's requirements and beyond.

In addition to the smooth servo performance, high current, small size, the customer also gained a very "GREEN" product.

Elmo's proprietary "FASST Power Conversion" Technology results in the lowest heat dissipation, which in addition to prolonging battery operating time and extending battery life, reduces the "environmental pollution" (Heat and EMI) to negligible levels.



Better than 99% efficiency

As a result of the high efficiency and “High Quality” power dissipation, the temperature rise is very slow and under full control. In fact, this scenario can maintain 150 A consumption for 500 seconds with an average current consumption of 100 A – 120 A. This is an ideal solution for autonomous guided vehicles and any battery powered application.

Elmo’s experts recognized the unique servo drive requirements of the M.I.T. WFT transport vehicle, and provided the answer - intelligence, high power in a compact package:

For vehicle wheel sets conveying up to 8 tons (7,257 kg), Elmo selected the Gold Drum 70/60 SE, - a 5.28 x 3.74 x 2.83 inch (134 x 95 x 72 mm) package.

For vehicle wheel sets conveying up to 25 tons (22,680 kg), Elmo selected the Gold Drum R150/100 SE - able to supply 150 A for extended periods, only limited by the thermal temperature reached in the drive heat sink. This servo drive employs advanced precision capabilities, in a compact package.

Elmo’s Gold Drum provides smooth, precise velocities, jitter-free motion and no tracking errors. Elmo’s ‘R’ type drives provide sustained high current for extended periods regardless of loads, providing the capability of 360° wheel movement, from a standstill position.

Elmo supplied the off-the-shelf servo drives and components to WFT, and provided extensive support to the WFT’s engineers, making it possible to upgrade the M.I.T. WFT vehicle rapidly and efficiently within two working days.

The Elmo solution included:

- Gold Drum 70/60 SE for wheel sets supporting up to 8 tons
- Gold Drum R150/100SE for wheel sets supporting up to 25 tons
- The Elmo Application Studio (EAS) for fast, easy servo drive setup



The Benefits

Elmo's solution confirmed to be an ideal match for the M.I.T. WFT transport vehicle:

- ▶ Demonstrating Elmo's "Smart Small and Simple" approach to be effective
- ▶ Providing a compact servo drive meeting high current and resolution requirements with maximized system performance
- ▶ Proving to be:
 - > An ideal servo drive for battery-operated applications for maximum efficiency
 - > A GREEN solution with negligible heat dissipation and negligible EMI
 - > Highly efficient, with ability to overcome any obstacle in its path

- ▶ Connecting to any legacy system and using the CANopen standard
- ▶ Enabling full real time synchronization between Elmo drives
- ▶ Easy installation and high accuracy using Elmo's EAS software
- ▶ Off-the-shelf products
- ▶ Full compliance to industrial STDs such as:
 - > EMC tests according to IEC 61800-3 and EN 61326-3-1
 - > Environmental tests according to IEC 61800-5-1
 - > Safety tests according to IEC 61800-5-1
 - > STO Safety tests according to IEC 61800-5-2
 - > Safety according to UL 508c
- ▶ Providing a operating vehicle within two days

The Summary

Elmo's Gold Drum servo drive was chosen for the next generation M.I.T. WFT transport vehicle because it solved all the key technical challenges and offered significant performance improvements. Elmo's solution also met the WFT's requirement to work with legacy equipment, open protocols, and to upgrade the vehicle within a matter of days.

"When we learned that Elmo could provide us with the **most accurate and powerful** servo drive, and that it would fit into the tight dimensions of our M.I.T, we were pleased to try it out. Elmo not only had **the right solution**, they also worked closely with us to install it – with Elmo's engineering support, we had a working vehicle **in only two days.**"

Mr. Franz Wittich, CEO, WFT

Inspiring Motion

Elmo designs, manufactures and sells innovative Motion Control solutions for military and industrial automated systems. Our technology turns axes faster, with better precision and greater synchronization. Our products achieve better results, cost effectiveness and maximum throughput in any given mechanics.

We are Inspiring Motion.