

# Drive & Motion **Solutions**

**Industry:** Metals

**Application:** Leveling, Slitting and Stacking

*More Drive & Motion **Solutions** by Industry/Application*

## Slitting Metal with Superior Specifications, Speed and Safety is Simplified with Unidrive SP in Servo and Vector Modes

The days of American metal service centers providing slit metal with poor edge quality, burr, wave, camber, crossbow, surface marking and improper slit width are numbered. To compete in the global market against low-cost and low-quality means delivering high value, high quality blanks. Fabricators of high quality products need the best materials they can find. Receiving quality metal from a service center ultimately saves costs.



Herr-Voss Stamco has always been driven by its customer's needs. It developed its Strand Extensioner slitting line with Tension Assist to eliminate the dangerous practice of manually packing outer mults with paper or cardboard during recoiling and to correct crowning found in rolled ferrous and non-ferrous metals for improved quality.

In response to customer demands for better output and throughput, Herr-Voss's new CNC slitter, and its Feed-to-Length and CNC stacker modules have been outfitted with new motion control technology, which further enhances safety, improves quality, increases throughput, and reduces the high costs associated with tooling.

The new Herr-Voss system doubles the output of traditional arbor-packed slitters, and produces stress-free blanks with clean edges and no significant surface marking. Pay-back on the systems is less than three years. The

resulting mults also have a consistent width tolerance of  $\pm 0.002$  inches -- less than half the industry standard. Operators never need to enter the line nor touch the tooling, and there is no need to stock or build sets of slitter heads to keep ahead of production.

To upgrade their multi-blanking line, Herr-Voss worked with Control Techniques distributor and integrator, DRV Inc. of Pittsburgh, PA, on their Feed-to-length system, CNC Compu-cut® Slitter, and CNC stacker.

With decades of experience in metal, wire and foil, Control Techniques has become the world leader in winding and rewinding drive technology and application software. More importantly, its innovative, intelligent and universal AC drive, the Unidrive SP was the only drive capable of meeting the demands of this application without additional hardware or processing overhead.

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## System Requirements

The requirements of three drive subsystems were lengthy, but the flexible integration features of the intelligent, Unidrive SP made it simple:

### Feed to Length Main drive system

Three (3) closed loop vector axes (Leveler, Slitter, Feeder) with the Feeder able to generate 1g of acceleration of material and position within  $\pm 0.002$  inches with a maximum settling time of 60 ms. (The best the competition could do was 200 ms with a wider tolerance.)

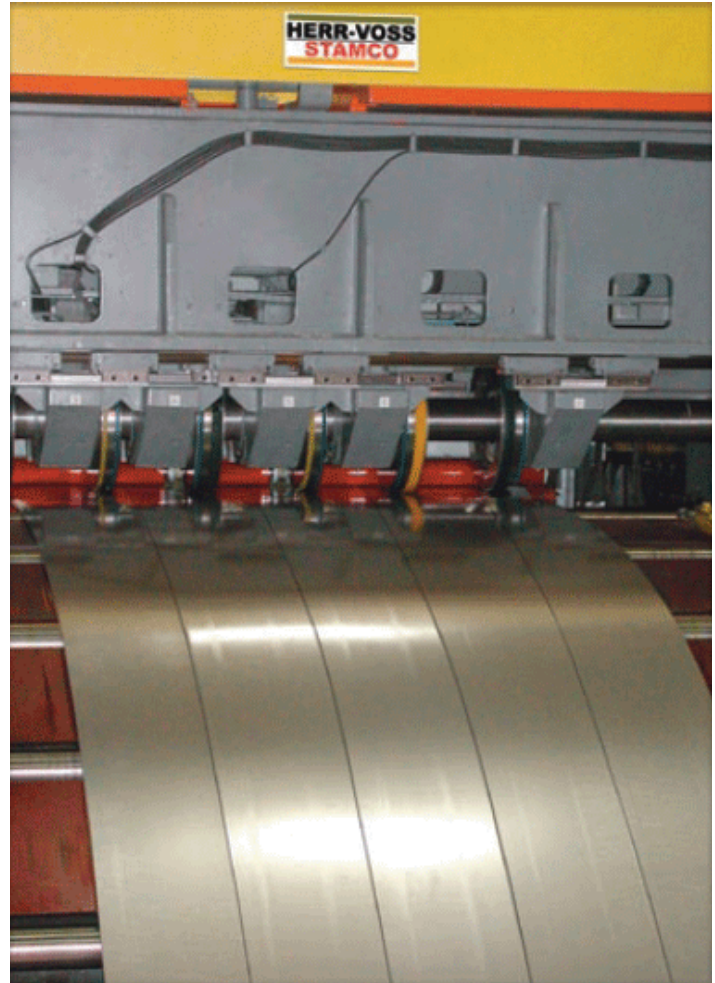
### CNC Slitter system

A scalable solution able to employ 13 to 24 axes with minimal program changes.

The ability to close the position loop on two different feedback devices (absolute linear encoder and motor encoder) to provide the fastest positioning to target location (closing the loop on the linear scale) and then provide the most stable method for holding the location by locking the motor in position by closing the position loop on the motor so the system would not attempt to respond to mechanical deflections, which can often show up in the linear encoder.

Support for Heidenhein EnDat (or SSI) feedback to go directly from the absolute linear encoder to the AC servo drive. Thus eliminating the use of protocol converters and allow for real-time position loop feedback from the device.

All digital control platform to allow switching of feedback devices (linear to rotary encoder) on the fly, modification to tuning parameters (gain adjustment based on feedback selected) and access to all axes positions and current limits (used for crash prevention and protection).



Ladder logic and PLC machine control functionality within the drive, eliminating the need for a PLC in this section of the machine.

### CNC Stacker

The ability to modify current limit at 1ms task time, which is required to allow axis motion with maximum speed while retaining the ability to limit torque before damaging mechanics or the customer part.

### Cost Effective Performance

According to DRV, the Unidrive SP was the most cost effective solution given all the system requirements, i.e., absolute feedback, closed loop vector and servo control, and the ability to change gains and torque limits on the fly. There were no other drives that could

deliver the performance, or do it without adding more hardware and complexity.

The new controls enable the machine to run up to 1,000 fpm on slitting lines and 250 fpm on multiblanking lines, depending on the load. The typical service center will be running 74" coils of aluminum, stainless, and steel to 50 ksi in thicknesses of 26 gauge to 10 gauge.

The Unidrive SP was key to cost savings and performance enhancement. This particular motion control solution employed many of the features of the Unidrive SP.

Here is the list of features that the Unidrive SP provided to make this solution possible.

### Feed-to-Length

- High Performance Vector Positioning Control (programmed with the same software as the servo sections).
- DeviceNet support
- High-speed drive-to-drive communication via CT-Net ( standard in SM-Applications module)
- Advanced Position Controller for ultra-high-speed synchronization (standard in the same SM-Applications module)

### CNC Slitter

- Permanent Magnet Servo Motor Control
- Same drive-to-drive and synchronization requirements as above, using SM-Applications module
- Ethernet communications, using the SM-Ethernet module
- Absolute Feedback support for two types of encoders



### CNC Stacker

- Permanent Magnet Servo Motor Control
- CANOpen communications support with SM-CANOpen module
- Same drive-to-drive and synchronization requirements as above, using SM-Applications module
- Ethernet communications, using the SM-Ethernet module
- Support for SSI – Absolute Rotary Encoder

The integration flexibility, features and performance of the Control Techniques Unidrive SP and IEC 61131-3 software enabled DRV to give Herr-Voss a complete, cost-effective modular feed-slit-stack machine that delivers the performance, ease of use, safety, and high value/high quality results sought by its customers and theirs. ■

[Click here for Unidrive SP product data.](#)

[Click here for Herr-Voss Stamco product data.](#)