

Application Note: Watt Drive frequency inverter PROFI-line P6000 controls a „Flying Saw“ without higher level PLC or controller

Many applications require the product being cut to length during run-out; typically at the end of a continuous production process.

Using the Watt Drive inverter of the Profi-line series P6000 and Watt gearboxes with the induction servo motors, this typical requirement of a „flying saw“ can be complied with – just using the integrated intelligence of the inverter without options.

The machine being referred to in this text produces acrylic glass rails in varying length. The raw material comes from an endless extrusion process and therefore has to be cut while moving.

The saw is mounted on a slide, which is traversed by a Watt Drive asynchronous gear motor with TTL encoder. The control of this motor is done by a **Profi-line P6000**. This inverter necessarily combines position control and synchronization of the saw.

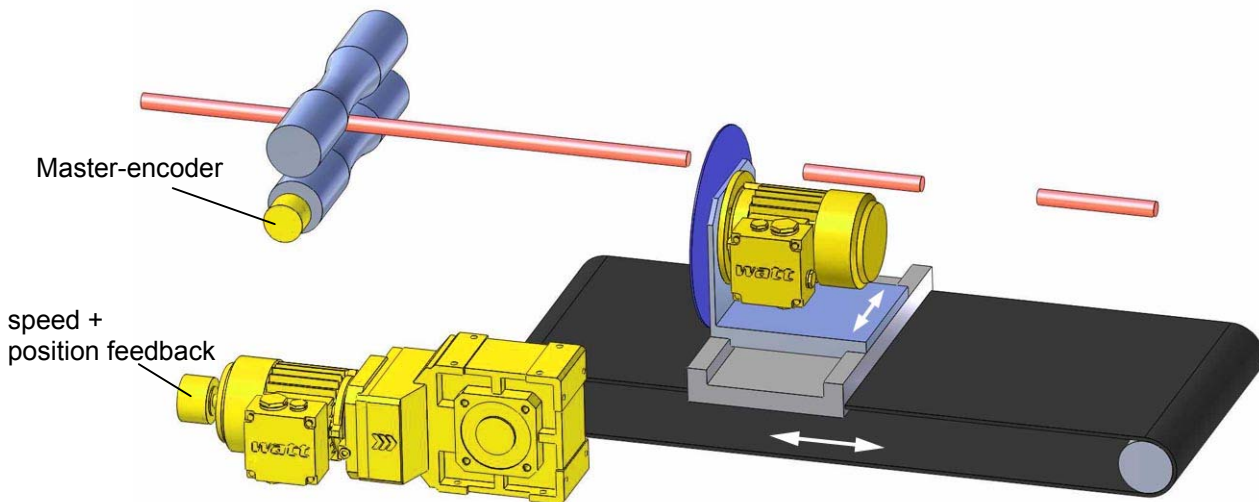
The better the control of the slide, the more precise the length of the cut piece, the smaller the necessary space for moving the saw and the smaller the installed power of the system.

In addition the programmable digital inputs can read a second, an HTL incremental encoder signal.

For ensuring the precise position control, the diameters of the gear-wheels, the gear ratio and roll diameters are calculated without approximation in true figures as a fraction.

For determining the length of the fed material, the signals of an HTL-encoder mounted on a metering wheel are used.

Also the speed of the blade of the saw is variable. For such a requirement, Watt Drive offers adequate inverters, the **ECO-line L2500** and **OPTI-line V2500**.



The basic challenge is that the slide of the saw has to be synchronized with the line speed of the rod and has to reach synchronous speed at the right cutting position. When reached, it must stay synchronous during the cutting procedure (avoiding stress on the saw-blade), then stop and return to starting position. Therefore the inverter needs information on how long the fed material has been, and what is the position of the slide.

So, it has to read and interpret two independent encoder systems.

The P6000 inverter has one interface for TTL incremental encoder signals and SSI absolute encoder signals.

The position information of the slide in this case comes from a TTL-encoder on the Watt Drive induction servo-motor.

A common customer request is to enter the data (i.e. cutting length) a machine specific values and units. Here Watt Drive offers a variety of programmable operator panels. These can be connected to the **P6000** inverter directly via CANopen using the standard-interface on board the drive.

The advantages of the Watt-solution are evident:

- no higher-level PLC or controller necessary
- complete drive system out of one hand
- cost and time saving at commissioning
- very economical solution as all functions and interfaces are on board by default (e.g. 2nd encoder input, CANopen-interface, control intelligence, etc.)