AC890 Registration boards

8902-M1 / 8903-M1

Description

The 8902-M1 and 8903-M1 feedback cards allow 1V p-p (peak-to-peak) Sin/Cos encoders to be connected directly to the motor controller to provide highly accurate speed feedback measurement and registration.

Fitted with those boards, the AC890 can achieve high-performance registration control in shaftless printing and converting applications, generally not possible in drive systems without expensive external registration controllers.

Two options are available, nevertheless registration applications are best achieved when both cards are used. The two option boards decode Heidenhain Endat 2.1 absolute position encoders and supply 5V or 10V for the encoder.

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Features:

Common Features

- Interpolates each encoder line with 11-bit accuracy giving 4 million counts per revolution on a 2048 line encoder
- Optional 1V input from 'Z' index pulse for use with registration
- Captures encoder position on arrival of every edge using up to two registration mark inputs

Additional 8903/M1 Features

- 4 optically isolated auxiliary digital inputs that can be used either for general purpose inputs, or for inputs from registration mark sensors
- 3 non-isolated auxiliary digital outputs that can be used either for general purpose outputs or for synthesizing an encoder output.

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Operating principles

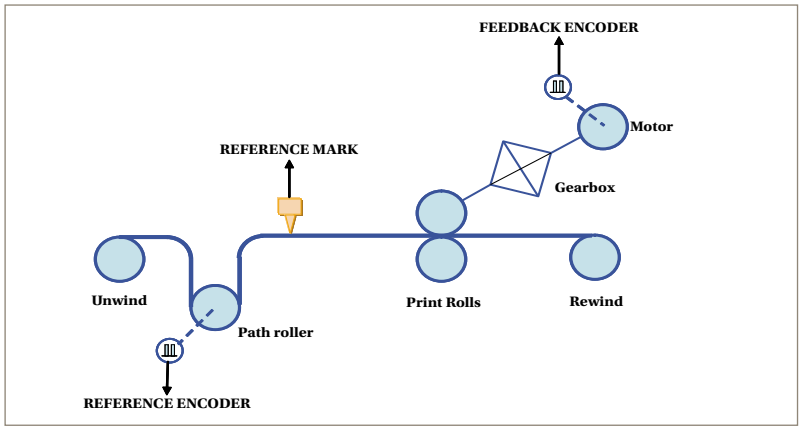
There are many different applications for registration, each having a unique set of requirements. The 8903-M1 and 8902-M1 are very flexible, allowing a wide variety of applications with a high degree of configurability by the user.

The 8903-M1 and 8902-M1 provide a closed-loop control system. A closed-loop position controller is an example of a closed-loop control system.
A setpoint, the reference, tells the control system where to position the output, for example a print shaft. Feedback, for example from a rotary encoder, tells the control system the instantaneous position of the motor shaft.
In the printing process example, the position controller causes the print cylinder to follow the print web position, so that the surface speed of the print cylinder is equal to the linear speed of the print web.
This describes a relative position controller. The position of the print cylinder is relative to some arbitrary starting position, i.e. the position when the system was turned on.
In general, this is not sufficient for a printing process. The print cylinder must usually be synchronised to pre-printed marks on the print web. This requires an absolute position controller. Absolute reference and absolute feedback are required.
Absolute reference position is usually provided by pre-printed marks on the web, which are detected by an optical sensor.

Absolute feedback position is provided in a variety of ways depending on the mechanical configuration.

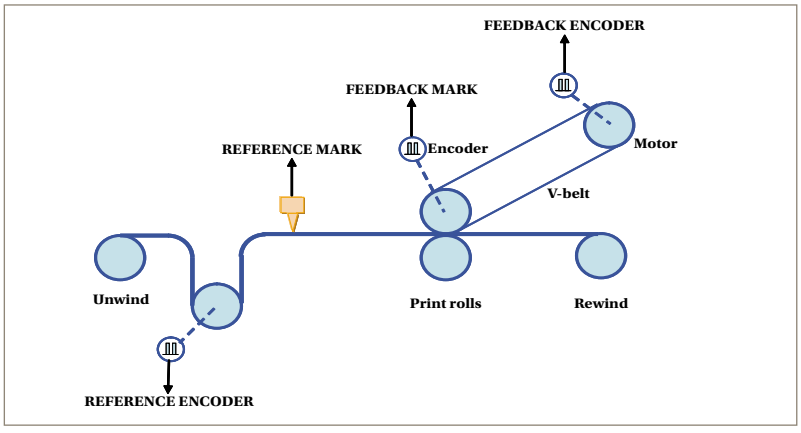
Note:
For further information on the AC890 Sin/Cos option boards, please refer to the technical manual : HA469269.
Available for download at:
www.parker.com/ssd

If the speed ratio between motor shaft and print cylinder is fixed, for example a direct drive or a gearbox, then the absolute position of the print cylinder can be deduced from the absolute position of the motor shaft. The motor shaft will usually have an encoder fitted to it that provides absolute position feedback as well as feedback for closing the drive's speed loop.
This is an example of **one-mark registration.**



If the speed ratio between motor shaft and print cylinder is not absolutely fixed, for example a V-belt, then an absolute feedback position sensor must be fitted to the print cylinder.

This is typically an encoder fitted to the print cylinder that provides a once-per-revolution index pulse.
This is an example of **two-mark registration.**



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