
16. AccuRange Line Scanner

16.1 General Description

The AccuRange Line Scanner consists of a motor with encoder and a mirror mounted on the motor. The mirror is machined from aluminum and coated with protected silver for high reflectance for both the 4000-LV and 4000-LIR. The mirror is encased in a cylindrical sleeve which together with the mirror forms a balanced system for minimum vibration when rotating.

The mirror deflects the outgoing beam from the sensor 90 degrees, and sweeps it through 360 degrees as the mirror rotates. Returning light is deflected off the mirror back into the sensor. The mirror surface is sized to match the collection aperture of the sensor.

Sensor and scanner are mounted on a flat plate that holds the mirror in the proper location relative to the sensor. The plate causes a blind spot of about 60 degrees of arc.

The line scanner is intended to be primarily used as a constant-speed scanner, although it is possible to control the position of the mirror through software to create a point-to-point scanner.

16.2 Scanner Performance Specifications

Mirror Reflectance: 96%. Total losses are 8% for the outgoing and return light together. This results in a slight reduction in sensitivity, which is not usually noticeable.

Maximum Motor Speed: 2600 R.P.M. Custom configurations with larger motors for higher speed are possible. This speed should not be exceeded, even though it is possible to do so with high motor power supply voltages and/or motor power settings.

Encoder: 2000 quadrature counts per revolution. 0/5 Volt levels, 2 channels plus index pulse.

Speed and Power Consumption: Motor speed at different voltages is shown below. This is the typical speed with power applied directly to the motor. If the scanner is controlled through the High Speed Interface, the motor speed will depend on the power level for which the motor is programmed.

Applied Voltage	Scanner Speed	Scanner Current
5.0	1050 rpm	45 mA
10.0	2100 rpm	90 mA
12.0	2600 rpm	110 mA

Typical Scanner Speed and Power

16.3 Scanner Installation and Use

If the scanner was ordered and delivered with an AccuRange 4000, the sensor will be mounted together with the scanner. If they were ordered separately, the sensor should be mounted so that the beam aligns with the motor axis, both in position and angle. If the scanner is ordered with the High Speed Interface, the motor encoder comes connected to the appropriate pins from the interface connector. For connection to other encoder readers, the encoder pinout is shown below.

Pin	Connector Wire Color	Function
1	Black (left side of encoder, viewed from top)	Ground
2	Blue	Index Pulse
3	White	Channel A
4	Red	Vcc (+5 Volts)
5	Brown	Channel B

Encoder Pinout

The index pulse is a brief pulse lasting 1/1000 of a revolution, occurring once per revolution. Channels A and B are standard quadrature signals, 50% duty cycle square waves, 90 degrees out of phase.

Do not attempt to remove the encoder from the motor. Encoder alignment is critical and will be lost. If necessary, the mirror can be removed from the motor shaft by loosening the two set screws holding the mirror sleeve to the shaft, but increased vibration at high motor speeds may result after reinstallation.

The mirror should be kept clean and free of excessive dust, fingerprints, etc. It may be cleaned with a soft cloth and alcohol or water.

16.4 Line Scanner Data Sheet

The following page is a reproduction of the data sheet for the AccuRange Line Scanner, which lists the specifications, and characteristics of the scanner.