Optical Encoders for Position

- Combines a transmissive optical sensor with a rotating mask

![Diagram of an optical encoder](image)
Optical Encoders for Position

- Quadrature incremental encoder
Optical Encoders for Position

- Quadrature Encoder States

<table>
<thead>
<tr>
<th>Encoder States</th>
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<tbody>
<tr>
<td>Disk rotation CCW</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>Ch. 1</td>
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<tr>
<td>Ch. 2</td>
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</tbody>
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Disk rotation CCW

Ch. 1 Encoder Signal

Ch. 2 Encoder Signal

Disk rotation CW

Detector

Emitter
Optical Encoders for Position

- **Absolute encoder**

  - Natural binary encoding
  - Multiple bit transitions
Optical Encoders for Position

• Absolute encoder

Gray code encoding

Single bit change
At each transition