

# thiNcoder® RT

Increase your design capabilities. Place rotors where you couldn't before.

## LOWEST PROFILE ENCODER AVAILABLE

- Ultra thin; non-invasive
- Package thickness below overlay is less than 0.085"

## LOW COST

- Lower component costs
- Integration eliminates secondary assembly processes
- No soldering required

## FLAT-PANEL INTEGRATION ON FLEX CIRCUIT

- Easily integrated with other switch product lines including PushGate® and MagnaMouse™ as well as dome and membrane switches into one thin panel
- Potential for increased PCB real estate and design flexibility

## SAVES POWER

- No parasitic power required as with optical encoders

## DESIGN CUSTOMIZATION (Multiple Codes and Indexing Options)

- Quadrature (Repeating 2-Bit Gray Code)
- Binary (Repeating 2-Bit Code)
- Analog Potentiometer
- Low-energy circuit capable – dry circuit compatible
- Detents/stops and knobs can be customized

## RELIABILITY/DURABILITY

- Life of 100,000 rotations

## ENVIRONMENTALLY SEALED CIRCUIT

- Eliminates through-holes



For Additional Information Contact:

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— Certified to ISO 9001:2000 —

**DAWAR**  
technologies  
the ultimate impression

U.S. PAT. Nos. 5,523,730; 5,666,096; 5,867,082; 5,990,772; 6,023,213; 6,069,545  
6,069,552; 6,130,593; 6,137,387; 6,262,646; 6,305,071; 6,369,692; 6,466,118  
CANADA PAT. No. 2177540  
CHINA PAT. No. ZL96110385.X  
TAIWAN PAT. Nos. NI 090979; NI 132948  
AUSTRALIA PAT. No. 727962



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## Mechanical

|   |                                    |
|---|------------------------------------|
| Cover Diameter  | 0.875" / 22.2mm                    |
| Cover Height  | 0.138" / 3.5mm                     |
| Shaft Diameter  | 0.236" / 6mm                       |
| Shaft Type  | Round with Flat                    |
| Shaft Length  | 0.285" / 7.24mm                    |
| Length of Flat  | 0.270" / 6.8mm                     |
| Dimension from Shaft Back to Flat                     | 0.178" / 4.5mm                     |
| Rotational Life<br>Carbon Ink Blend<br>Copper on Flex | >100,000 cycles<br>>500,000 cycles |
| Contacts  | Ball Armature                      |
| Shear Force of Shaft                                  | 12lbs. / 50N                       |

## Detent

|                      |  |
|----------------------|--|
| Number of Detents    | 0, 1, 16(22.5°), 24(15°) Stock<br>Custom Available |
| Detent               | Ball and Spring                                    |
| Stop Plate Positions | 300° Sweep Standard<br>Custom Available            |
| Stop Strength        | 3.0 in. lb. / .35Nm<br>Nominal                     |
| Rotational Torque    | 2.5 in. oz. / 17mNm<br>Nominal                     |

## Material

|                             |                             |
|-----------------------------|-----------------------------|
| Rotor / Shaft / Detent Ring | Engineering Thermoplastic   |
| Cover                       | Plated Brass Alloy          |
| Magnet Material             | Rare Earth                  |
| Circuit                     | Polyester Flex              |
| Ball Armature               | Gold Plated Stainless Steel |

## Electrical (Switch Type and Codes)

|  |  |
|--|--|
| Quadrature (Repeating 2 Bit Gray Code) | 8 (16 Detent), 12 (24 Detent)<br>Pulses / 360°                                       |
| Binary (Repeating 2 Bit Code)          | 8 (16 Detent), 12 (24 Detent)<br>Pulses / 360°                                       |
| On/Off Switch                          | Available  |
| Analog Potentiometer                   | Available  |
| Analog Potentiometer Resistance        | 1K - 10K ohm, 300° Sweep<br>Linear Taper Standard<br>Total Resistance Tolerance ±20% |
| Voltage                                | 3 to 30 VDC  |
| Current                                | 10mA   |
| Power                                  | 100mW Maximum  |
| Electrical Life                        | >100,000 Cycles  |
| Maximum Contact Resistance             | <500 ohms at End<br>of Life  |
| Open Circuit and Insulation Resistance | >20 Meg ohms<br>(Between Mutually Insulated Parts)                                   |
| Voltage Breakdown                      | 250 VAC (Peak to Peak,<br>Between Mutually Insulated Parts)                          |

## Environment

|                                    |                |
|------------------------------------|----------------|
| Storage                            | -40°C to 85°C  |
| Operating Temperature              | -40°C to 85°C  |
| Thermal Shock                      | -40°C to 85°C  |
| Humidity Resistance                | 95% RH         |
| Salt Fog, 5% Solution              | 24 Hours       |
| Shock                              | 100g           |
| Drop                               | 8 Feet         |
| Carbon Ink Blend<br>Copper on Flex | -54°C to 105°C |

Circuit: Analog Potentiometer  
Attributes: Used in those applications that require continuous output. Can be used with or without detents.  
Example: Temperature Control

Circuit: Selector Switch  
Attributes: Used in those applications that require a single switch closure at each detent position. Positions can range from 2-24 (16 position shown)  
Example: Motor Speed Control

Circuit: Quadrature or repeating 2-Bit Gray Code  
Attributes: Increment/Decrement switch that can be used as an encoder or rotary switch.  
Example: Volume Control

Circuit: Repeating 2 Bit Binary Code  
Attributes: Used in those applications to select 1 of 4 possible outputs which require a defined binary output at each detent position.  
Example: Replacement for multiple push button switches



\*Not actual size