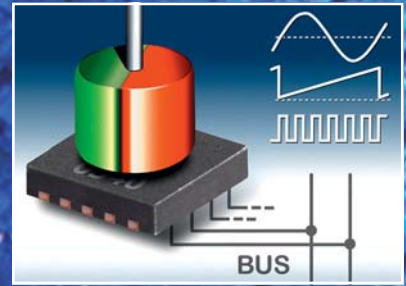


iC-MA ANGULAR HALL ENCODER



iC-MA provides the absolute angular position of a magnet placed above or below the chip's package, whereas a set of four distributed Hall sensors grants a reasonable system assembly tolerance. Controlled signal amplitudes are ensured by the embedded signal conditioning circuit also monitoring a "loss of magnet" condition for Z-axis detection.

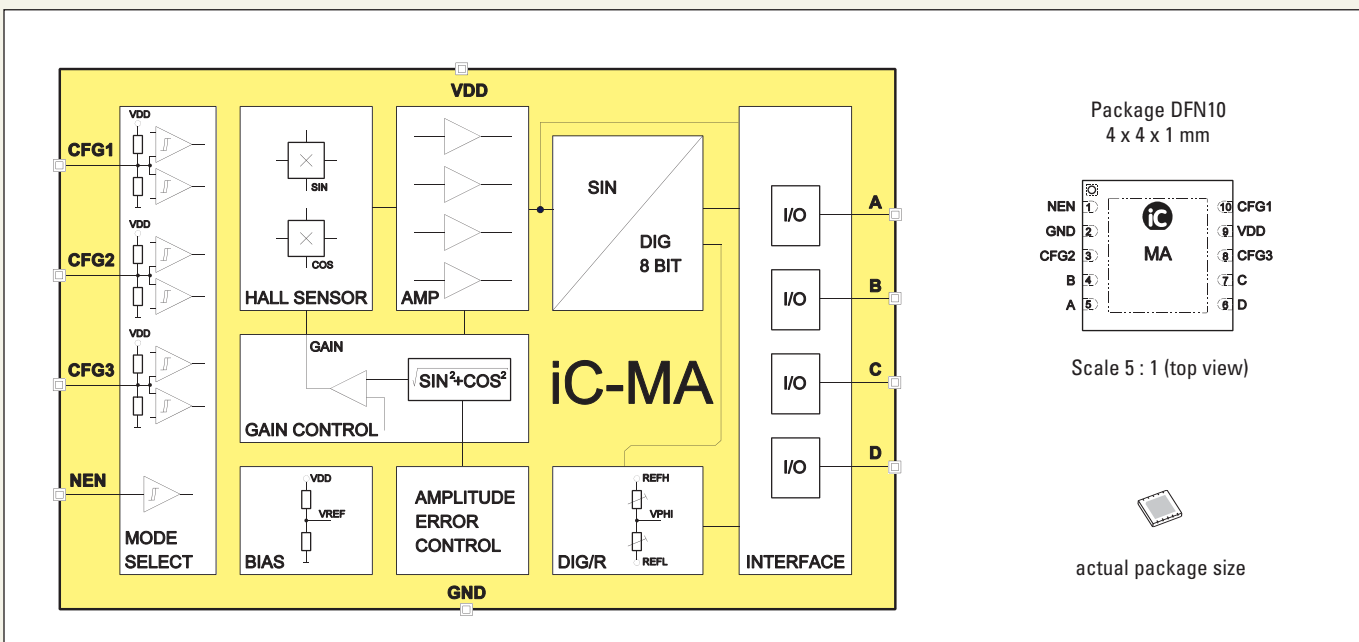
The encoding stage operates on 6, 7 or 8 bit resolution and can resolve a 360 degree magnet turn into 256 angular steps, i.e. into increments of 1.4°. Different operating modes are available by pin selection offering analog output signals (sawtooth, triangle, sine/cosine) as well as digital output signals (encoder quadrature, counter control). A sequencer logic eases daisy chaining of multiple sensors on a 4-wire bus and can be selected optionally.

Applications

- Contactless rotary switch
- Digital potentiometer
- Angular encoding
- Motion control and robotics
- Positioning and servo systems
- Commutation of brushless DC motors
- Vehicle control
- Office equipment
- Flow meter
- Household appliances
- Joystick and front panel controls

Features

- Resolution of 64, 128 and 256 positions within 360°
- Rotation speed up to 60,000 rpm
- Outputs configurable to provide analog and digital signals
- Fail signal for low magnetic strength
- Cascading multiple iC-MA allows use of single bus
- Enable input for low power standby
- Small DFN10 Package (4 x 4 x 1 mm)
- Wide operating temperature range of -40 to +125°C

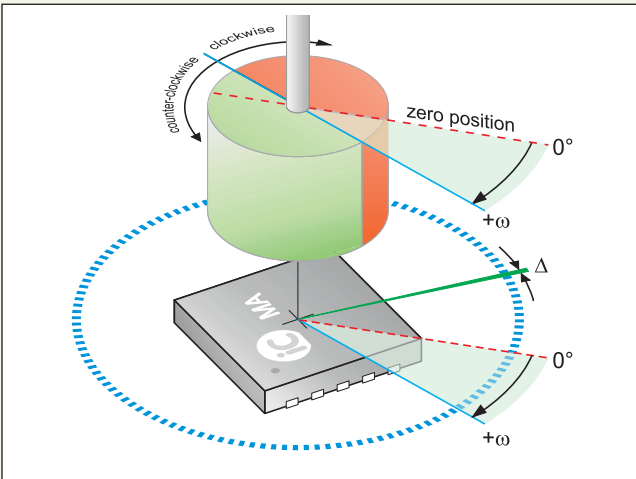


iC-MA ANGULAR HALL ENCODER

Pin Functions

No.	Name	Function
1	NEN	Not Enable / Standby
2	GND	Ground
3	CFG2	Configuration Input 2
4	B	I/O
5	A	I/O
6	D	I/O
7	C	I/O
8	CFG3	Configuration Input 3
9	VDD	+5 V Supply
10	CFG1	Configuration Input 1

Definition Of Angular Position



Key Specifications

General	
Supply Voltage	5 V ±10 %
Supply Current	20 mA max.
Standby Current	200 µA max.
Analog Output (sine/cosine)	controlled to 2 V _{pp}
Max. Rotation Speed	60,000 rpm
Magnetic Field Strength	20 ... 100 kA/m
Digital Resolution	6, 7, 8 bit
Angular Resolution	5.6, 2.8, 1.4 degree
Operational Temperature Range	-40 to +125 °C
ESD Susceptibility	2 kV (HBM 100 pF, 1.5 kΩ)

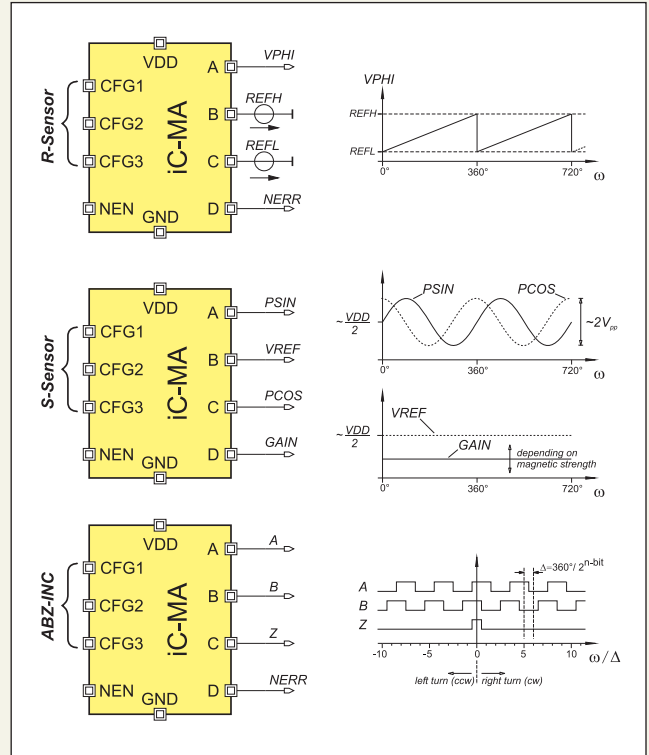
Operational Modes

Name	Output Signal
R-Sensor	analog triangle or ramp, output magnitude, error (NERR)
D-Sensor*	analog sine and cosine, mean value, gain signal
S-Sensor*	analog sine and cosine, noninverted and inverted
ABZ-INC*	quadrature signals (A,B), index (Z) and error (NERR)
CLK-INC	counter signals: count up / down, clock, clear, error (NERR)

* Daisy chain operation is configurable.

This preliminary information is not a guarantee of device characteristics or performance. All rights to technical changes reserved.

Configuration Examples



Chain Configuration Example

