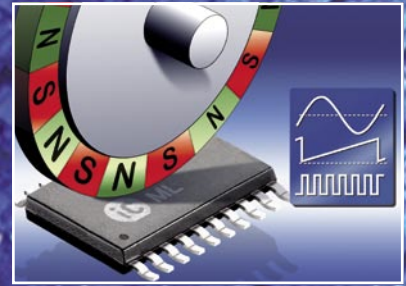


# iC-ML HALL POSITION ENCODER



iC-ML supplies the absolute linear position of a magnetic tape placed above the chip's package, with a Hall sensor array granting a reasonable system assembly tolerance. Controlled signal amplitudes are ensured by the embedded signal conditioning circuit also monitoring a "loss of magnetic field" condition.

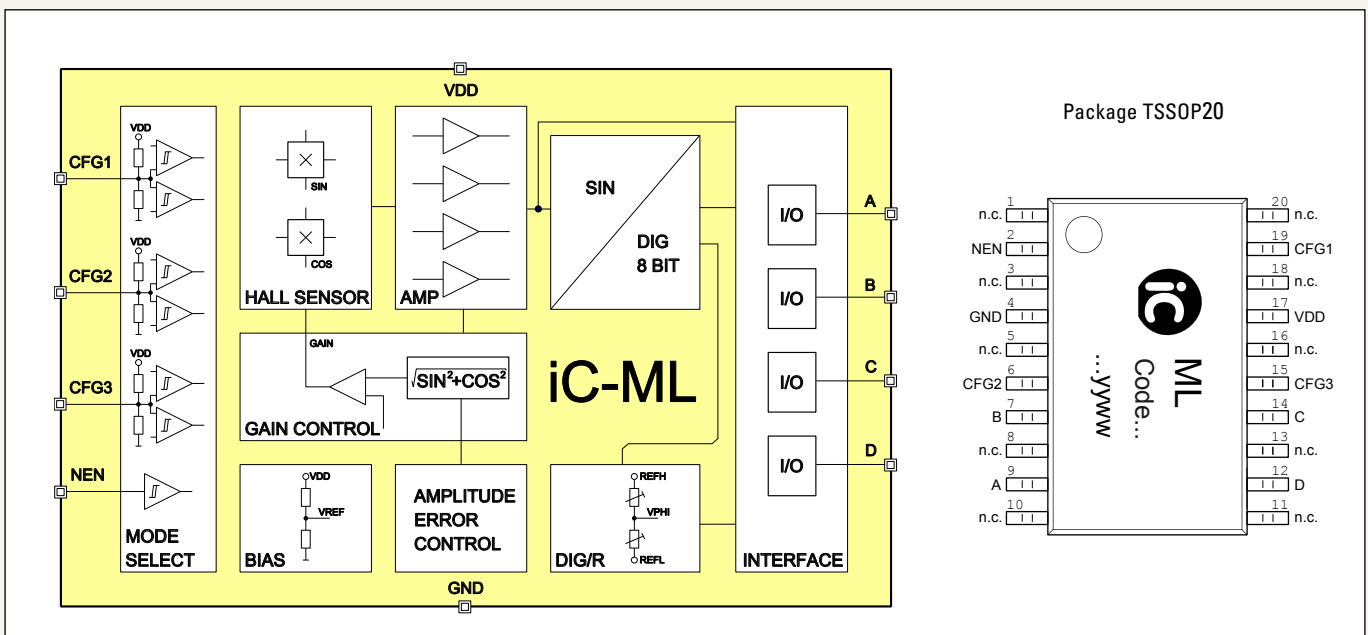
The encoding stage operates on 6, 7 or 8 bits of resolution and can resolve a magnetic period into 256 linear steps, i.e. into increments of 20  $\mu\text{m}$  (tape with a pole pitch of 2.56 mm). Different operating modes are available by pin selection, offering both analog output signals (sawtooth, triangle and sine/cosine) and digital output signals (encoder quadrature and counter control). A sequencer logic eases daisy chaining of multiple sensors on a 4-wire bus and can be selected optionally.

## Applications

- Linear encoding
- Angular encoding by using pole wheels
- Motion control and robotics
- Positioning and servo systems
- Commutation of brushless linear motors
- Vehicle control
- Office equipment
- Flow meter
- Household appliances
- Joystick and front panel controls

## Features

- Resolution of 64, 128 and 256 positions within magnetic period
- Linear speed of up to 5 m/s at 8 bit resolution
- Outputs configurable to provide analog and digital signals
- Fail signal for low magnetic strength
- Cascading multiple iC-MLs allows the use of a single bus
- Enable input for low power standby
- TSSOP20 package
- Wide operating temperature range of -40 to +125°C

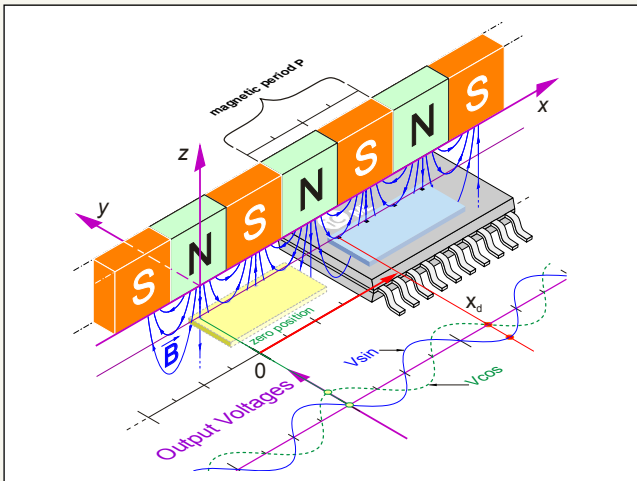


# iC-ML HALL POSITION ENCODER

## Pin Functions

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

## Definition Of Linear Position



## Key Specifications

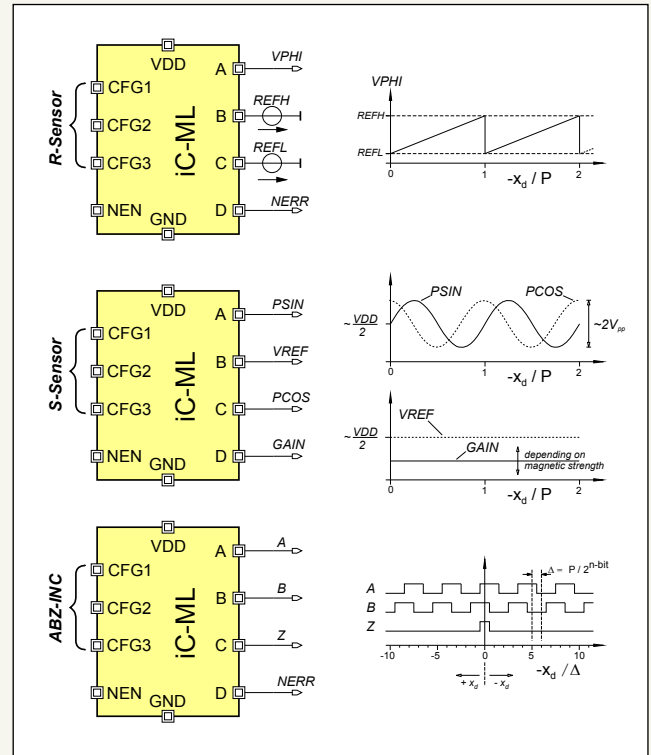
General	
Supply Voltage	5 V $\pm$ 10 %
Supply Current	20 mA max.
Standby Current	200 $\mu$ A max.
Analog Output (sine/cosine)	Controlled to 2 V <sub>pp</sub>
Linear Speed (2.56 mm magn. pitch)	5 m/s @ 8 bit
Magnetic Field Strength	20 ... 100 kA/m
Digital Resolution	6, 7, 8 bit
Linear Resolution (2.56 mm magn. pitch)	80, 40, 20 $\mu$ m
Operational Temperature Range	-40 to +125 °C
ESD Susceptibility	2 kV (HBM 100 pF, 1.5 k $\Omega$ )

## Operational Modes

Name	Output Signal
R-Sensor	Analog triangle or ramp, output magnitude, error (NERR)
S-Sensor*	Analog sine and cosine, mean value, gain signal
D-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.

## Configuration Examples



## Chain Configuration Example

