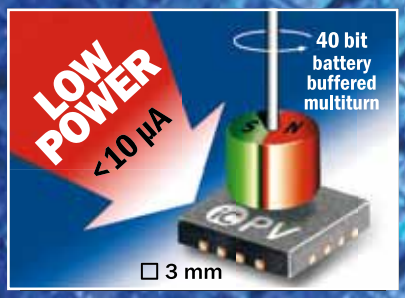
iC-PV

BATTERY-BUFFERED HALL-MULTITURN ENCODER



iC-PV is an ultra-low power magnetic encoder with up to 40 bit multiturn (revolution counting) and 3 bit singleturn resolution reading a cylindrical, diametric permanent magnet. The Hall signal processing is designed for battery operation at low power consumption, but can also be configured to track angle acceleration exceeding 500 000 rad/s^2 and speed beyond 100,000 rpm.

Together with an additional singleturn encoder, such as iC-MHM, iC-LGC or iC-LNB for instance, a complete multiturn position sensor can be built. Furthermore, iC-PV offers 3-bit position data at parallel outputs to support microcontroller operated systems.

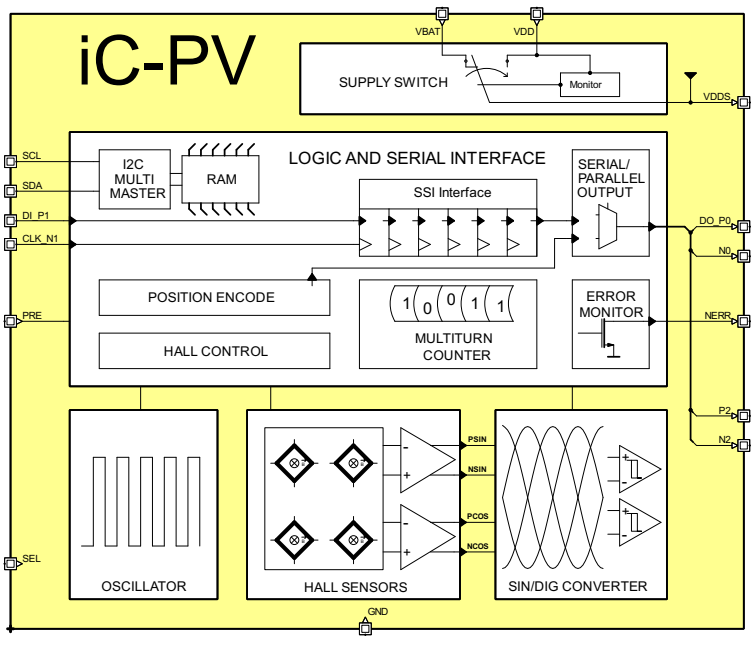
Via its multi-master capable I²C interface iC-PV can source its startup configuration from the EEPROM available to the system.

Features

- Integrated Hall sensors with auto-gain and offset control
- Adjustable performance of tracking (12,000 to 100,000 rpm) versus power consumption (2 µA to 30 µA in average)
- Configurable multiturn counting of up to 40 bits
- Octal encoder mode (singleturn) with 3-bit parallel output
- Shift-register input for singleturn position
- Shift-register output of synchronized MT/ST position
- SSI multiturn data output with error, parity, and sync. bits
- Adjustable multiturn preset value
- Pin-triggered preset and boot-up from external EEPROM
- I²C multi-master interface to read EEPROM
- Supply voltage range of 3.0 V to 5.5 V
- Integrated supply switching to backup battery
- Error output on overspeed, low battery, and CRC failure
- Space-saving 16-pin QFN package

Applications

- Gearless revolution counting
- Metering applications
- Absolute end-of-shaft position sensors
- Multiturn encoders



iC-Haus

Am Kuemmerling 18 • D-55294 Bodenheim, Germany
Phone: +49 (6135) 9292-300 • Fax: +49 (6135) 9292-192 • http://www.ichaus.com

iC-PV BATTERY-BUFFERED HALL-MULTITURN ENCODER

Key Specifications

General	
Main Supply Voltage VDD	single 3 V to 5.5 V
Main Supply Current VDD	typ. 3.0 mA
Battery Supply Voltage VBAT	3.0 V to 5.5 V
Battery Supply Current I(VBAT)	< 10 µA (@ 3.3 V)
Operational Temperature Range	-40 °C to +125 °C

Assembly Tolerances Sensor to Magnet		
Ø Magnet	Distance	Radial Displacement
3 mm	up to 4.0 mm	up to 1.0 mm
4 mm	up to 6.0 mm	up to 1.5 mm
8 mm	up to 7.0 mm	up to 3.0 mm

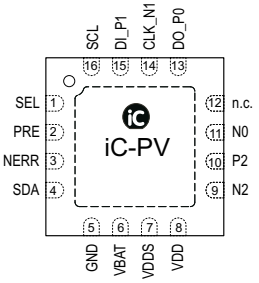
Hall Array Dimensions/Signal Conditioning	
Diameter of Hall Sensor Circle	1.75 mm
Magnetic Field Strength	10 to 100 kA/m
Magnetic Input Frequency	2 kHz max. (up to 120 000 rpm)

Operating Modes	
SSI Multiturn (9 to 40 bit)	for sensors with MT interface (iC-MHM, iC-MU, iC-LGC, iC-MN etc.)
Chain Multiturn (9 to 40 bit) with Singleturn Input (3 to 18 bit)	with synchronization of singleturns (iC-LNG, iC-LNB etc.)
Stand-alone SSI Multiturn (9 to 40 bit)	for battery-buffered metering applications
Parallel Singleturn (3 bit)	parallel complementary output (default op. mode w/o EEPROM)

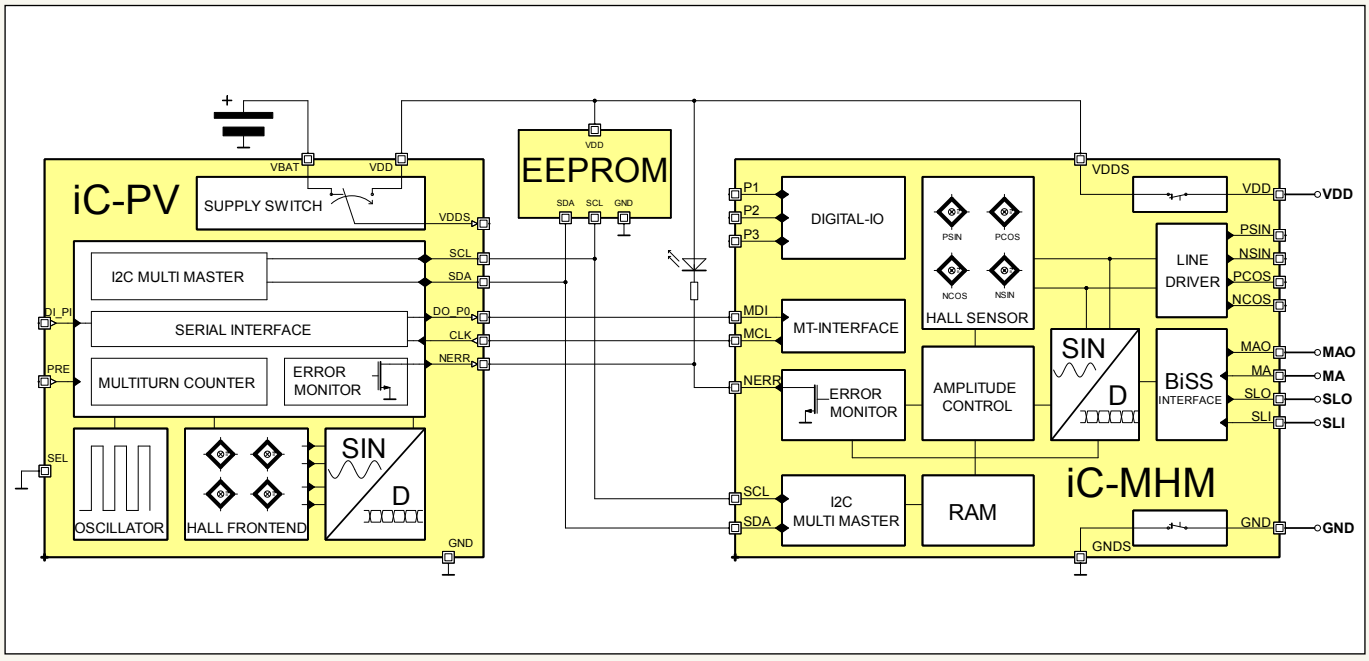
Pin Functions

No.	Name	Function
1	SEL	Mode Select Pin
2	PRE	Preset Trigger Input
3	NERR	Error Message Output (active low)
4	SDA	EEPROM Interface, I²C data line
5	GND	Ground
6	VBAT	Battery Supply Voltage Input (typ. 3.6 V)
7	VDDS	Switched Supply Voltage Output
8	VDD	+3.0 V to +5.5 V Supply Voltage Input
9, 11	N2, N0	Parallel Output Bit 2, Bit 0 (negative logic)
10	P2	Parallel Output Bit 2 (positive logic)
12	n.c.	not connected
13	DO_P0	MT Interface, data outp. / Par. Output Bit 0 (pos.)
14	CLK_N1	MT Interface, clock line / Par. Output Bit 1 (neg.)
15	DI_P1	MT Interface, data input / Par. Output Bit 1 (pos.)
16	SCL	EEPROM Interface, I²C clock Line

Package QFN16 3 mm x 3 mm



Application Example



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