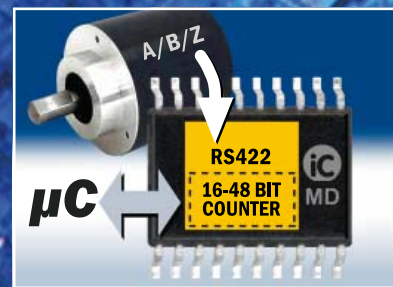


iC-MD RS422 QUADRATURE ENCODER RECEIVER / COUNTER



iC-MD processes quadrature encoder signals (with A, B and index) of up to 3 incremental encoders. Possible counter configurations are 1x 48 bit, 2x 24 bit, 3x 16 bit, 1x 32+1x 16 bit. Various input signals are applicable: differential RS422 and up to 12 V levels and TTL, CMOS and LVDS logic signals. The device can be accessed by a microcontroller via its SPI interface, or can be operated as a BiSS C or SSI slave device.

The implemented touch probe function is triggered by pin TPI, configurable to be sensitive at the rising, falling or both edges. Upon the trigger register TP1 is loaded with the actual value of Counter 0, whereas the former value of TP1 is shifted to register TP2. Thus, evaluating a distance between two events is made easy for the external controller, even for timing critical applications.

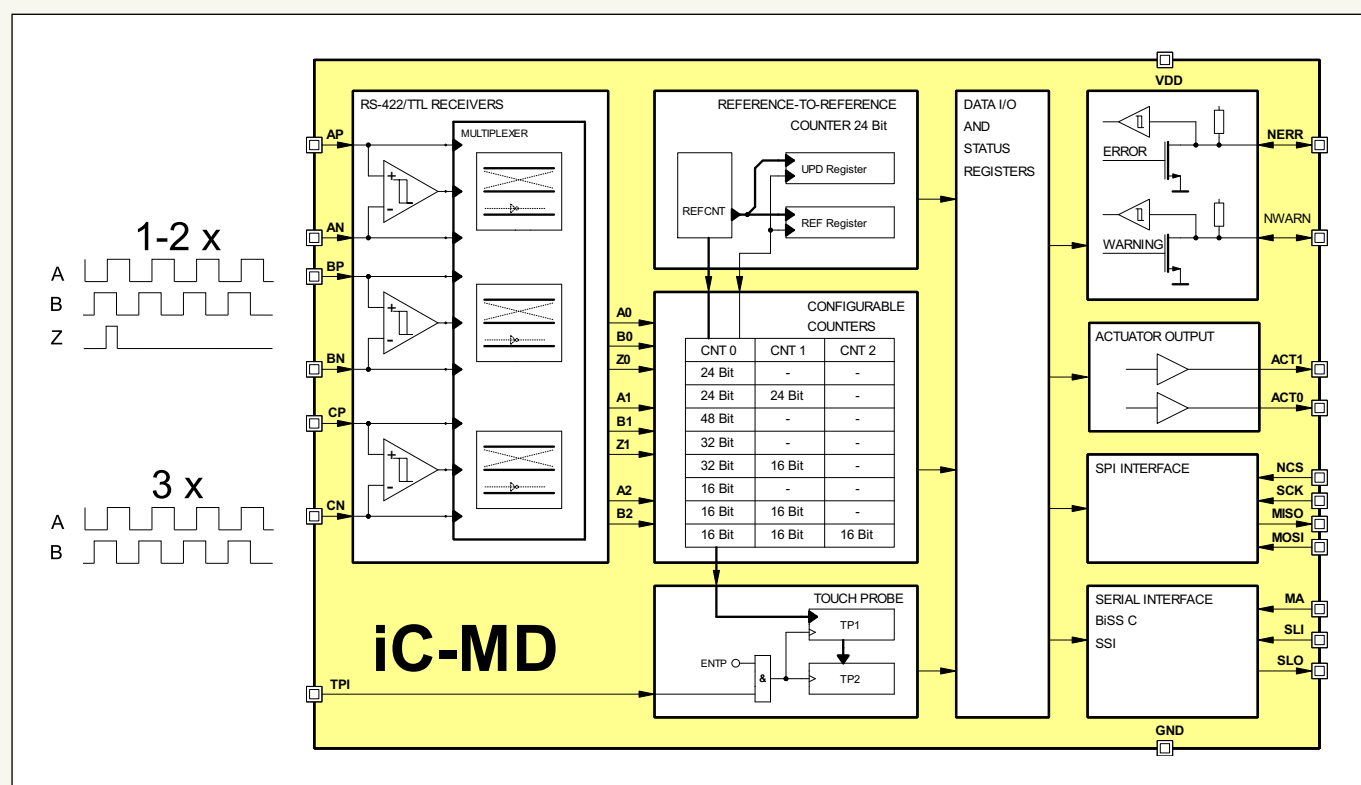
An additional 24 bit reference counter is available to latch the number of pulses between consecutive index signals, to evaluate distance-coded reference marks (REF and UPD register).

Applications

- PLC interface to linear scales and rotary encoders
- Digital gauges with touch probe function for height and length measurement
- Motion control
- Quadrature encoder interfacing and processing

Features

- Counter resolutions: 16, 24, 32 and 48 bit
- Up to 3 AB/ABZ quadrature counters configurable
- High count frequency of up to 40 MHz
- Pin triggered touch probe function
- Evaluation of distance-coded reference marks
- Cascading/bus capable via SPI and BiSS C Interface
- RS422, TTL, CMOS, LVDS input signals
- Operating temperature -40 °C to +125 °C, small TSSOP package



The register UPD is loaded at every index pulse with the value of the "Reference Counter", it is the number of AB edges between the last two index pulses.

REF and UPD register permit a numeric calculation of the absolute position, that is determined by changing distances between three following references. With a short travel the absolute position within a long distance system can be calculated.

Pin Functions

No.	Name	Function
1	SLO	BiSS C (SSI) Interface, Data Output
2	SLI	BiSS C (SSI) Interface, Data Input
3	MA	BiSS C (SSI) Interface, Clock Input
4	AP	Signal Input (CH0 / CH0)
5	AN	Signal Input (CH0 / CH0)
6	BP	Signal Input (CH0 / CH1)
7	BN	Signal Input (CH1 / CH1)
8	CP	Signal Input (CH1 / CH2)
9	CN	Signal Input (CH1 / CH2)
10	GND	Ground
11	nERR	Error Message Output (low active) / System Error Message Input
12	nWARN	Warning Message Output (low active) / System Warning Message Input
13	MISO	SPI Interface, Data Output
14	MOSI	SPI Interface, Data Input
15	SCK	SPI Interface, Clock Input
16	NCS	SPI Interface, Chip Select (low active)
17	VDD	+ 5 V Supply Voltage
18	ACT0	Actuator Output
19	ACT1	Actuator Output
20	TPI	Touch Probe Input

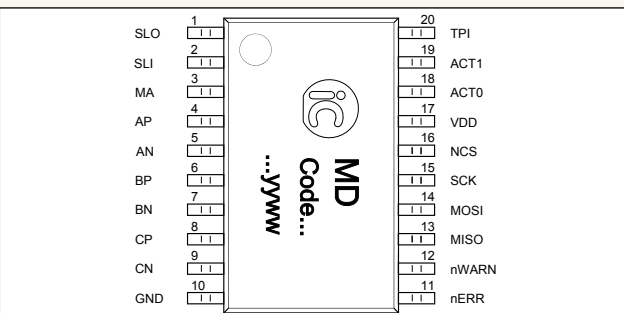
Key Specifications

General	
Supply Voltage	5 V +/- 10%
Supply Current	20 mA max.
Count Frequency	40 MHz max.
SPI Clock Frequency	10 MHz max.
BiSS Clock Frequency	10 MHz max.
Operational Temperature Range	-40 °C to +125 °C
ESD Susceptibility	2 kV (HBM 100 pF, 1.5 kΩ)

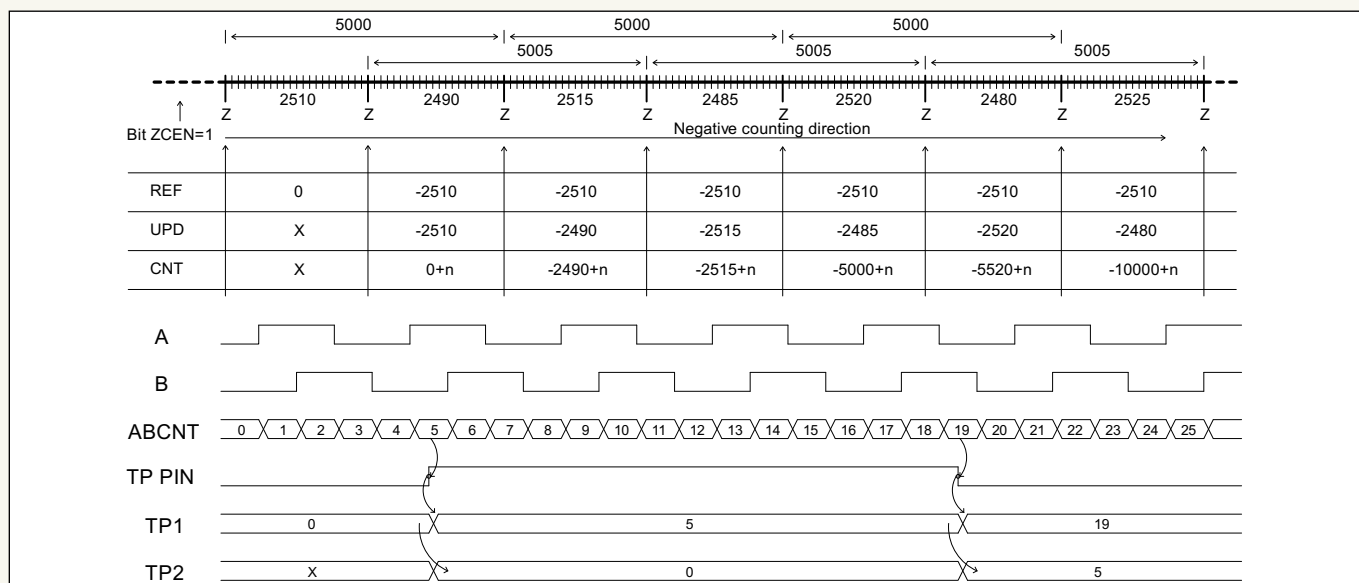
Operation Modes

Counter Configuration	CH0	CH1	CH2	CH0
	Single Ended TTL			Differential RS422/LVDS
1 x 16 bit	A, B, Z	-	-	AP/AN, BP/BN, ZP/ZN
1 x 24 bit	A, B, Z	-	-	AP/AN, BP/BN, ZP/ZN
1 x 32 bit	A, B, Z	-	-	AP/AN, BP/BN, ZP/ZN
1 x 48 bit	A, B, Z	-	-	AP/AN, BP/BN, ZP/ZN
2 x 16 bit	A, B, Z	A, B, Z	-	-
2 x 24 bit	A, B, Z	A, B, Z	-	-
1 x 32 bit, 1 x 16 bit	A, B, Z	A, B, Z	-	-
3 x 16 bit	A, B, Z	A, B	A, B	-

Pin Configuration TSSOP20



Distance-Coded Reference Marks and Touch Probe Function



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