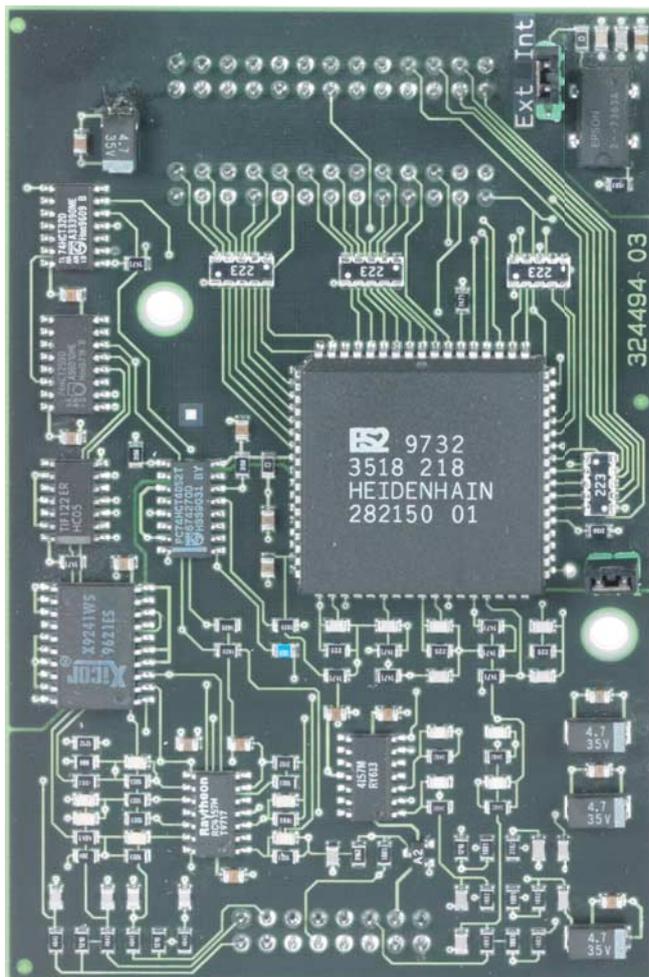




HEIDENHAIN



Product Information

IK 410V

Interpolation and
Counter Card

Description

The **IK 410V** is an interpolation and counter PCB for length and angle measurement by an incremental **encoder** with sinusoidal voltage signals (**1 V_{pp}**). It also provides an input for **commutation signals** (one sine/cosine per revolution) of a motor encoder. It is therefore well suited for motor control. The IK 410V is inserted directly onto the PCB of a customer-specific control or in the subsequent electronics.

The IK 410V can operate in two modes. In the period-counter mode, the number of signal periods is counted in a 32-bit register. In the interpolation mode, the encoder signal is also interpolated by a factor of 1 024 (10 bits) and added to the number of signal periods (32 bits). The measured value can be read out directly over the 16-bit data bus of the control or subsequent electronics.

Pin Layout

X1: Interface to subsequent electronics; 26-pin AMP connector

Signal	Gnd	Gnd	$\overline{\text{Sync1}}$	$\overline{\text{Sync0}}$	$\overline{\text{L1}}$	$\overline{\text{L0}}$	$\overline{\text{INT}}$	$\overline{\text{RD}}$	$\overline{\text{WR}}$	A4	Gnd	A2	A0
PIN	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	13a
PIN	1b	2b	3b	4b	5b	6b	7b	8b	9b	10b	11b	12b	13b
Signal	Vacant	Vacant	Vacant	Vacant	+5 V	+5 V	+5 V	+5 V	Gnd	A5	A3	A1	Gnd

X2: Interface to subsequent electronics; 26-pin AMP connector

Signal	Gnd	D14	D12	D11	D9	Gnd	D6	D4	D3	D1	Gnd	$\overline{\text{Res}}$	Clk
PIN	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a	11a	12a	13a
PIN	1b	2b	3b	4b	5b	6b	7b	8b	9b	10b	11b	12b	13b
Signal	D15	D13	Gnd	D10	D8	D7	D5	Gnd	D2	D0	$\overline{\text{CS}}$	Gnd	Gnd

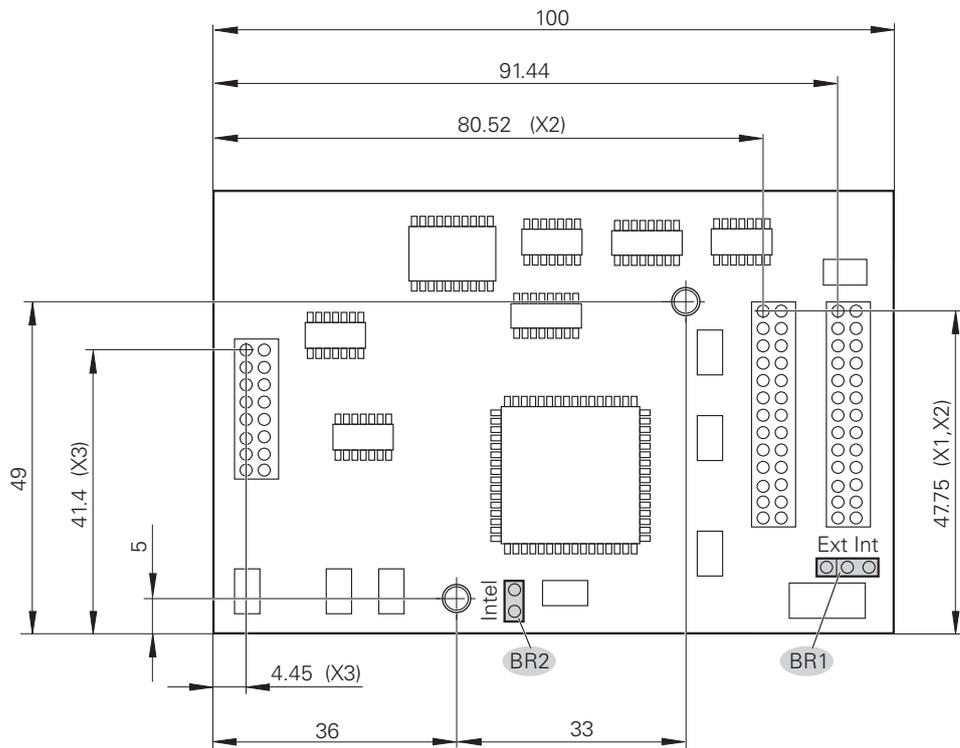
X3: Encoder input: 16-pin AMP connector

Signal	A+	Gnd	B-	R+	Gnd	C-	D-	+15 V
PIN	1a	2a	3a	4a	5a	6a	7a	8a
PIN	1b	2b	3b	4b	5b	6b	7b	8b
Signal	A-	B+	Gnd	R-	C+	D+	+5 V	-15 V

Specifications

	IK 410V
Encoder input	For one encoder 16-pin AMP plug connector X3
Input signals	<ul style="list-style-type: none"> • Incremental signals A, B • Reference mark signal R • Commutation signals C, D (one sine and one cosine per revolution from the Z1 track)
Signal level	$\sim 1 V_{PP}$
Input frequency	350 kHz max. with a maximum cable length of 60 m 250 kHz max. with a maximum cable length of 150 m (the supply voltage of $5 V \pm 5 \%$ at the encoder must be ensured by an external power supply)
Adjustment of encoder signals	Offset adjustment via register in the counter components Phase and amplitude adjustment by electronic potentiometer
Signal subdivision	1024-fold
Counting functions	Two modes of operation: <ul style="list-style-type: none"> • Period counter: 32-bit count value • Period counter with interpolation: 32-bit count value and 10-bit interpolation value
Data register	<ul style="list-style-type: none"> • 48 bits; only 42 bits are used for the measured value
Measured value latching	Alternatively through <ul style="list-style-type: none"> • External asynchronous latch switches ($\overline{L0}$ or $\overline{L1}$) • Software command • Traversing the reference marks
Access time	Typically 30 μs
Delay	200 ns \pm 100 ns (between request and actual latching, with maximum clock frequency of 20 MHz)
Processing time	Max. 25 μs
Interface to subsequent electronics	16-bit microcomputer interface appropriate to a static RAM 26-pin AMP plug connectors X1 and X2 Management bus \overline{RD} , \overline{WR} , \overline{CS} , \overline{Res} , Clk (max. 20 MHz) Data bus D0 to D15 Address bus A0 to A5 Latch inputs $\overline{L0}$, $\overline{L1}$ Latching synchronization $\overline{Sync0}$, $\overline{Sync1}$ (for simultaneous latching over two or more cards) Interrupt output \overline{INT} Power supply Gnd and +5 V ($\pm 5 \%$), $\pm 15 V$ ($\pm 5 \%$) Approx. 20 mA (without encoders)
Data format	MOTOROLA or INTEL format (switchable)
Operating temperature Storage temperature	0 °C to 55 °C -30 °C to 70 °C

Dimensions



Dimensions in mm



Tolerancing ISO 8015
ISO 2768 - m H
< 6 mm: ± 0.2 mm

HEIDENHAIN

DR. JOHANNES HEIDENHAIN GmbH

Dr.-Johannes-Heidenhain-Straße 5

83301 Traunreut, Germany

☎ +49 8669 31-0

FAX +49 8669 5061

E-mail: info@heidenhain.de

www.heidenhain.de