

Technical Data:

Interfaces	
Analog input	- Sine- / Cosine- / Reference signal: differential or single-ended - Nominal amplitude configurable to 1 V_{pp} / 500 mV_{pp} / 250 mV_{pp} / 75 mV_{pp} - Maximum input frequency up to 220 kHz
ABZ	- 90° square wave sequences (A/B/Z) - Adjustable width of the index signal Z of ¼ or 1 period A/B - Error signal - Interrupt signal for µC - Additional signals for sensor adjustment
SPI	- 30 bit count value / 16 bit multi-turn value - Data rate up to 500,000 measured values/s - 9 bit signal monitoring - Compatible with standard SPI: 16 bit, MSB first, up to 25 MHz - Signal filter for noise suppression, configurable
SSI	- SSI 20 bit or 32 bit - 2 bit signal monitoring - Gray code / binary code - Adjustable timing - SSI ring mode
Feature / Parameter	
Interpolation rates	- Interpolation basis rate: 4096, 4000, 3200, 2560¹⁾ - Configurable divider: 1, 2, 4, 8, 16, 32, 64, 128 additionally for basic IR 4096 (256, 512, 1024) - Interpolation rate adjustable at will via EEPROM table, default setting: ¹⁾2560
Signal adjustment	- AMAC-specific digital controller for the offset, control range ±10% of the nominal amplitude - AMAC-specific digital controller for the amplitude, control range 60% ... 120% of the nominal amplitude - Digital potentiometer with 64 steps for phase correction; setting range ±5° or ±10° - Input signal monitoring with configurable error indication
Signal correction	- Wobble correction for periodic errors over 360° (rotary encoder) - Signal form correction for periodic errors within one sine/cosine period (for linear encoder too) - Can be activated or deactivated separately
Interference suppression	- Adjustable low-pass filter (Cut-off frequencies 10 kHz, 75 kHz, 250 kHz) - Digital hysteresis to suppress output edge noise - Adjustable minimum edge separation (band width limitation) at the output
Reference signal processing	- Adjustable reference position 0 ... 360° - Definition of the optimal reference position via SPI or additional signals - Processing of distance coded reference marks - Measured value trigger at the reference position
Other	- 2-stage measured value trigger - Programmable timer (3.2 µs ... 420 ms) - Constant delay between sampling and measurement for all resolutions (at 40 MHz): without signal correction 2.35 µs; with signal correction 3.95 µs - Multi-turn counter
Important Characteristics	
Package	QFN56 (8 x 8 mm)
Operating Voltage	3.3V
Temperature Range	-40 ... +125°C

Ordering information

Product Type	Description
AM-IP4k	Interpolation circuit AM-IP4k, QFN56
AM-IPE4k	Interpolation unit with AM-IP4k (Standard configuration ABZ)
USB to SPI Converter	USB to SPI Interface Unit