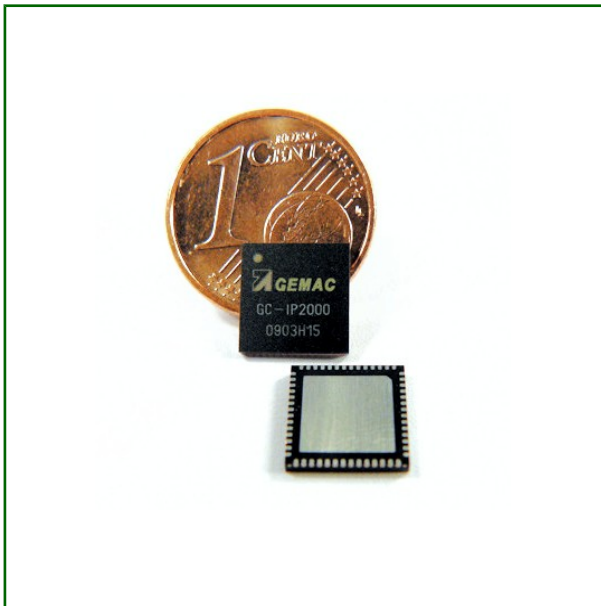




Interpolation Products

Linecard & Selection Guide

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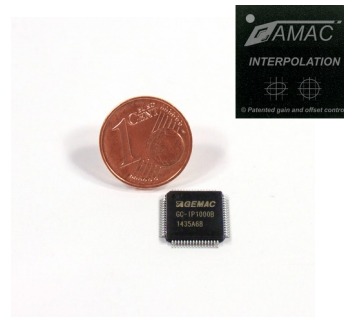
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1 Interpolation Products Linecard

1.1 Interpolation ICs¹⁾

GC-NIP	Nonius-/ Two-Channel Interpolator up to 8192-fold
AM-IP4k	Interpolator up to 4096-fold NEW
GC-IP2000	Interpolator up to 2048-fold
GC-IP1000B	Interpolator up to 1024-fold
GC-IP201(B)	Interpolator up to 256-fold
GC-IP200 ²⁾	Interpolator up to 200-fold
GC-AIP40	Interpolator up to 40-fold
GC-LS ³⁾	Four-Channel Level-Shifter



¹⁾ bare DIE available

²⁾ not recommended for new designs, replace with GC-IP201(B)

³⁾ for 5V encoder application and interpolation circuits with 3.3V operating voltage

1.2 Interpolation Units

IPE16000	Interpolation Unit, up to 16000-fold incl. software tool
AM-IPE-NONIUS	Nonius Two-Channel Interpolation Unit NEW incl. software tool
AM-IPE4k	Interpolation Unit, up to 4096-fold NEW incl. software tool
IPE2000	Interpolation Unit, up to 2048-fold incl. software tool
IPE201	Interpolation Unit, up to 256-fold incl. software tool
IPE40	Interpolation Unit, up to 40-fold











1.3 Accessories

USB to SPI Converter USB to SPI Interface Unit



2 Selection Guide

	GC-NIP	AM-IP4k NEW	GC-IP2000	GC-IP1000B	GC-IP201(B)	GC-IP200 ¹⁾	GC-AIP40
Interpolation Rates	32.....8192	4 .. 4096	100.....2048	100....1000	20...256	20...200	4...40
Power Supply	3.3V ²⁾	3.3.V	3.3V / 5V	5V	3.3V ²⁾	5V	5V
Analog Input	-6 channels: sine / cosine / reference (index) -Differential or single ended signals		-3 channels: sine / cosine / reference (index) -Differential or single-ended signals				
Input Signal Range (differential)	30mV _{PP}900mV _{PP}	45mV _{PP}1.2V _{PP}	45mV _{PP}1.2V _{PP}	80mV _{PP}1.2V _{PP}	36mV _{PP} ...800mV _{PP}	800mV _{PP}1.2V _{PP}	60mV _{PP}1.2V _{PP}
Input Frequency	Up to 150kHz	Up to 220kHz	Up to 260kHz	Up to 110kHz	Up to 440kHz	Up to 400kHz	Up to 1.2MHz
Signal Correction	-AMAC-specific gain and offset control -Sensor- or scale-specific correction coefficients -Preset function		AMAC-specific gain and offset control 				
Outputs / Interfaces	ABZ / LVTTTL (<23MHz) SPI SSI BiSS Monitor outputs Error signal	ABZ / LVTTTL (< 40MHz) SPI SSI Monitor outputs Error signal	ABZ / TTL (< 25MHz) SPI Monitor outputs Error signal	ABZ / TTL (<22MHz) SPI Monitor outputs Error signal	ABZ / LVTTTL (< 40MHz) SPI SSI BiSS ³⁾ Monitor outputs Error signal	ABZ / TTL (< 40MHz) SPI Parallel Monitor outputs Error signal	ABZ / TTL (< 32MHz) Monitor outputs
Delay	Constant delay < 8µs	Constant delay	Constant delay 5µs	Constant delay 5.2µs	Constant delay 2.4µs	Constant delay 2.4µs	Constant delay < 150ns
Internal Counter	Single-turn track 1 & 2 Nonius	Single-turn Multi-turn	Single-turn	Single-turn	Single-turn Multi-turn	Single-turn	
Configuration Options	-Via pins -Via serial interface (SPI) -Via serial interface (BiSS-C) -Via internal EEPROM	-Via serial interface (SPI) -Via internal EEPROM	-Via pins -Via serial interface (SPI) -Via EEPROM	-Via pins -Via serial interface (SPI) -Via EEPROM	-Via pins -Via serial interface (SPI) -Via serial interface (BiSS-C) -Via internal EEPROM	-Via pins -Via serial interface (SPI)	-Via pins
Serial Interface (SPI)	Up to 15MHz SPI-Clock	Up to 25MHz SPI-Clock	Up to 25MHz SPI-Clock	Up to 4.7MHz SPI-Clock	Up to 25MHz SPI-Clock	Up to 7.6MHz SPI-Clock	
Temperature Range	-40°C to +125°C	-40°C to +125°C	-40°C to +125°C	-40°C to +85°C	-40°C to +150°C	-20°C to +85°C	-40°C to +125°C
Package	 QFN64 (9mm x 9mm)	 QFN56 (8mm x 8mm)	 QFN56 (8mm x 8mm)	 TQFP64 (10mm x 10mm)	 QFN40 (6mm x 6mm)	 TQFP64 (10mm x 10mm)	 TSSOP20

¹⁾ not recommended for new designs, replace with GC-IP201(B), ²⁾ for 5V encoder application and interpolation circuits with 3.3V operating voltage GC-LS (level shifter circuit) is recommended, ³⁾ GC-IP201B only

Calculation of maximal input frequency: Rotary encoder $f_{max} = (\text{revolutions / minute}) \times (\text{signal periods / revolution}) / 60$

Linear encoder $f_{max} = (v_{MAX} [\text{in m/s}] / (\text{signal period} [\text{in mm}])) \times 1000$

Only if external counter is used - input frequency is limited by interpolation rate and output frequency: $f_{IN} < f_{OUTABZ} / \text{Interpolation rate}$