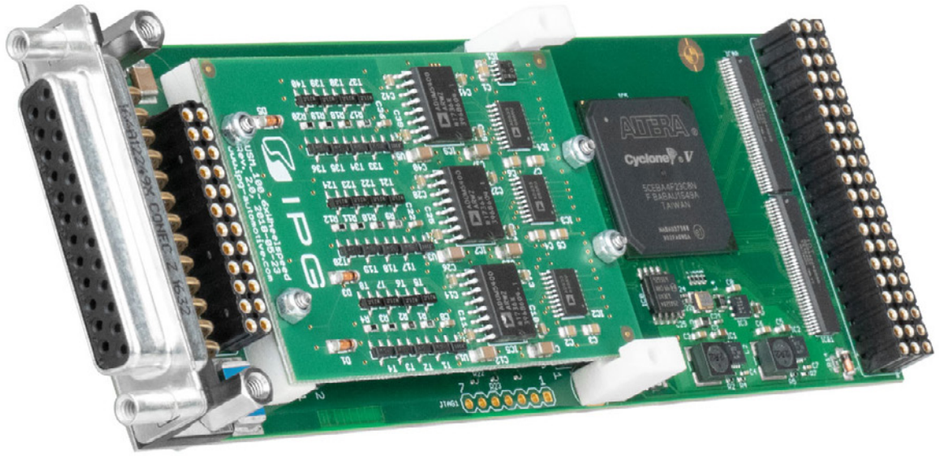
M400 – Active Wheel Speed Generator



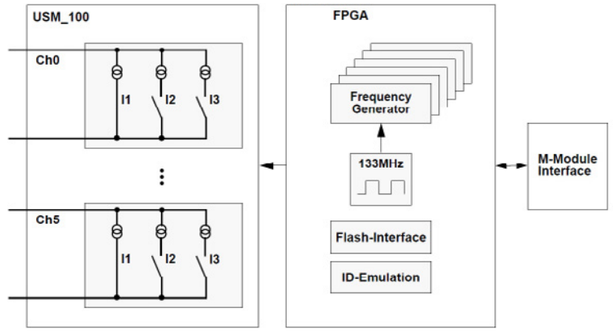
Features

- 6 independent galvanically isolated frequency outputs
- Support of conventional wheelspeed sensors as well as wheelspeed sensors with serial data protocol, e.g. Continental OH42x and OH44x
- Possibility to simulate missing teeth
- Configurable jitter for each individual tooth
- Support of the currents needed by the ECU, no external adaptation circuits necessary
- Usable as current source and current sink
- Possible currents: +/-7, 14, 21mA and 28 mA
- Accuracy and range of values: 40 bits
- Jitter (peak to peak): 7.5ns
- Galvanic isolation for each channel to each other and to system supply
- 2 different frequency update modes:
  - Immediate frequency adaptation
  - Synchronized frequency adaptation
- 3 different pulse width modes:
  - Pulse-duty factor
  - Fixed high level duration
  - Fixed low level duration

Use Cases

- Emulating 6 active wheel speed sensors ESC test systems
- Providing conventional sensor signals or serial protocol data
- Testing fail-safe mechanisms by simulation of missing teeth

Block Diagram



Technical Data

Number of output channels	6
Currents	+/-7mA, 14mA, 21mA, 28mA
Rated voltage range	• 6V <= (WSH - WSL) <= 22V • Inverse-polarity protected
Frequency range	0 ...1MHz
Supported sensor types	• Conventional active wheel speed sensors (7mA /14mA) • Sensor with serial protocol, based on Continental OH42x10 • Sensor with serial protocol, based on VDA specification (e.g. Continental OH44x)
Serial protocol	Up to 15 free configurable data bits
Baud rate of serial protocol	Configurable in a range of 10 .. 240us
Number of teeth per turn	Up to 255 teeth per turn, configurable
Missing teeth	Up to 255 missing teeth per wheel turn, configurable
Jitter of teeth	Each tooth can be shifted in between a range of “-” half the gap between 2 teeth and “+” half the gap between 2 teeth
Accuracy	
Output current	• Better than +/-3%
Frequency resolution	• <520kHz: 0.00024Hz • >=520kHz: 0.01552Hz
Pulse width resolution	• Pulse-duty factor mode: better than $2x10^{-10}$ • Fixed pulse width mode: 1 digit=7.5ns
Jitter (peak to peak)	• 7.5ns
Connector	25 Pin SubD connector, female
Address space	A08D16 or A24D32

Order Information

Order Number	IO-M400

Alternatives

M404	For emulation of passive wheel speed sensors