

## imc CANSAS-IGN

Module for determining the ignition angle of gasoline motors

Technical datasheet Version 1.5, released 01.06.2012



imc CANSAS-IGN

The **imc CANSAS-IGN** provides four electrically isolated inputs for connection of an ignition signal, a crankshaft sensor, a reference signal and a camshaft sensor. Based on the ignition time and the crankshaft position, the module calculates the ignition angle and the motor's current RPM-value. Those values are output as CAN-data, displayed on an alphanumeric display and additionally available as normalized analog 10 V signals.

<b>Order code:</b>	Article number
<b>CANSAS-IGN</b>	1050277

### imc CANSAS-IGN

Fan-less handheld aluminum housing (4x BNC signal terminals)  
205 x 115 x 45 (W x H x D in mm)  
Weight typ. 800 g

### Interconnections

- CAN-Bus connected via 2 DSUB-9 terminals; CAN IN (male), CAN OUT (female)  
CAN-Bus Interface for sending measurements on the CAN-Bus at rates of up to 1Mbit/s
- Signal terminals on the module:  
BNC terminals for galvanically isolated capture of ignition signal, crankshaft sensor, reference signal (zero-impulse) and camshaft sensor.  
DSUB-15 terminal for analog output of ignition angle and RPM-signal as well as the digital output of conditioned TTL-signal representations for all inputs.
- Power supply via Phoenix (MC1, 5/4STF-3,81) socket (CAN/Power-Plug)

### Operating conditions

- Operating temperature: -30°C to 85°C condensation allowed
- Shock resistance 50 g pk over 5ms (without plug)

### Included accessories

- power supply plug Phoenix (female)
- Calibration certificate as per DIN EN ISO 9001
- Mounting brackets (4 angular brackets and 8 screws)
- Instruction manual

### Measurement channels

- 1 channel for capturing the ignition signal.  
Inductive transducers, clamp probes at ignition coil's primary or secondary line or logic level signals are supported.
- 1 channel for capturing the crankshaft signal.  
The engine's VRS sensor or Hall sensor or logic level signals are supported. Various patterns are supported, see table.
- 1 index channel (reference).  
Logic level signals with 1 pulse per crankshaft revolution are supported. This is the reference output of an incremental encoder attached to measure crankshaft position.
- 1 channel for capturing the camshaft position.  
Logic signals with 1 pulse per camshaft revolution as well as capture of the camshaft measurement wheel's cog pattern are supported. As well, motors with adjustable camshafts (also variable camshaft control or variable valve control) are supported. Measurement of the camshaft position is optional and only necessary when targeting the ignition angle of selected cylinders.
- all channels fully conditioned; the threshold levels, as well as the hysteresis for each channel are adjustable. For each channel low pass filters, AC coupling, absolute value calculation can be activated.

### CAN interface

- CAN-Bus Interface for sending results on the CAN-Bus at rates of up to 1Mbit/s, (equipped in accordance with the CiA<sup>®</sup> Draft Standard 102 Version 2.0, CAN Physical Layer for Industrial Applications)
- 1 message with current or averaged values of speed and ignition angle.
- Optional CAN messages with min/max/mean values for a maximum of 4 selected cylinders. Detection of cylinders is based on the camshaft signal.
- In Snapshot mode CAN messages provide high speed sampled data of all input channels.

### Configuration Software:

- imc CANSAS 1.8 or higher
- Alternatively it is possible to configure the module for CAN-network applications either -by order- at factory. Additional information concerning operation (cables and additional accessories) are presented in the documentation "*Integrating CANSAS in CAN Networks*".
- The module's configuration can be exported by the software; this makes it possible to transfer configurations made by others by means of just the module.

## IGN: Technical Details

### Datasheet Version 1.5 (ignition angle measurement module)

Parameter	Value (typ. / max)		Remarks
Inputs	1		ignition signal
	1		crankshaft sensor
	1		reference signal
	1		camshaft signal
			inputs isolated from CAN-Bus, supply and mutually.
Sampling rate (CAN output)	1 Hz to 200 Hz		Output rate, averaging interval
Time resolution of measurement	333 ns		counter frequency 3 MHz (primary sampling rate)
Input pulse frequency	max. 600 kHz		
RPM range	100 to 20000 RPM		
Ignition angle range	-100 to 100 degrees		
Adjustable signal delay	max. 10 ms		
Crankshaft sensor	36-1, 36-2, 60-1, 60-2, 36+1, 24-1 2 to 3600 cogs 1 pulse		with missing cog sensor with zero impulse sensor with 1 pulse per revolution
Camshaft sensor	Freely editable pattern with 1..20 signal edges per camshaft revolution		use is optional, for an automatic cylinder recognition
Resolution ignition angle	0.1° 0.01°		on display on CAN
Resolution RPM	1 RPM 0.5 RPM		on display on CAN
Input configuration	differential		configurable 5 V pull-up resistor
Input impedance	1 MΩ		
Input voltage range	±40 V		differential
Switching threshold	-40 V to +40 V		individually adjustable per channel
Hysteresis	0 V bis 40 V		individually adjustable per channel
Common mode input voltage	max. ±60 V		
Overvoltage protection	±100 V		long-term
Analog bandwidth	500 kHz		-3 dB (full power)
Gain uncertainty	<1 %		23°C
Offset	<1 %		23°C
Integrated Snapshot-mode	20 kHz to 3 MHz		high resolution analog sampling and output of all input channels especially for diagnostic assistance
Resolution of the analog primary data	12 Bit		
Frequency stability	<100 ppm		aging <±5 ppm / year
<b>Analog output</b>			
Range	-10 V to +10V 0 V to 10 V		ignition signal -100° to +100° RPM 0 to 10000 RPM
Load current	±10 mA / channel (max.)		
Gain uncertainty	<±5 mV	<±10 mV	-30° - 85°C
Offset uncertainty	<±2 mV	<±4 mV	-30° - 85°C
<b>Digital outputs</b>			
Level	TTL		representation of all input signals

<b>General</b>		
CAN-Bus	defined by ISO 11898	
Isolation: CAN-Bus analog input	$\pm 60$ V $\pm 60$ V	to case(CHASSIS) nominal; testing voltage: 300 V (10 s) nominal; testing voltage: 100 V (10 s)
Sensor supply	+12 V ( max 100 mA) +5 V ( max 200 mA)	Reference: GND
Display	2 lines 0.2 s, 0.5 s, 1 s	alphanumerical frame rate
Supply voltage	10 V to 30 V DC	
Power consumption	4 W (typ.)	12 V supply, 23°C
Operating temperature	-30°C to 85°C	typically, display can be read in temperatures above 15°C
Dimensions (W x H x D)	205 x 115 x 45 mm	imc CANSAS-IGN
Weight	800 g	
Connection terminals	4xBNC 1x DSUB-15  2x DSUB-9 PHOENIX (MC 1,5/4STF-3,81)	inputs outputs  CAN (in / out) power supply