

# InteliBifuel



Order code: IB2SGXDCBDK

## Bi-Fuel/dual fuel control system for single speed engine

# Datasheet

### Product description

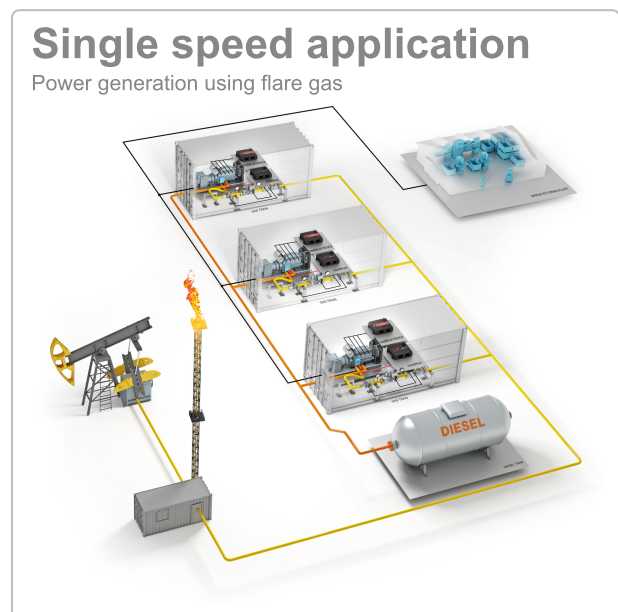
- ▶ InteliBifuel package is a fully programmable solution designed for any single speed Bi-Fuel application.
- ▶ Its features perfectly suitable for Oil & Gas, Mining and Rental applications.

### Key features

- ▶ New control algorithm with automatic compensation for gas quality change
- ▶ Enable factory setting of Bi-Fuel system (optionally)
- ▶ Simplified installation and commissioning
- ▶ Extended PLC logic and history
- ▶ GPRS/GSM remote monitoring by plug-in module
- ▶ GPS positioning by plug-in module
- ▶ Gas consumption calculation (using gas injectors)
- ▶ Compatible with InteliVision displays (display 5", 8", 17")
- ▶ High or low pressure single point gas injection technology, gas injected before or after the turbocharger
- ▶ Harsh environmental design
- ▶ Supply voltage: 8-36 VDC continuously, 6 VDC for 1s
- ▶ EMC compatibility: EN61000-6-1/2/3/4, SS4631503 (PL4), IEC 255-3

- ▶ Vibration resistivity: IEC 60068-2-6, 2-25Hz 1.6mm, 25-100Hz 4g
- ▶ Shock test: IEC 68-2-27
- ▶ Dust and water protection IP69

### Application overview



## Technical data

### Power supply

Power supply range	8-36 VDC
Power consumption	0,25A at 24VDC
RTC battery	10 years (replaceable by official service)
Fusing	2 A (without BOUT consumption)

### Operating conditions

Operating temperature	-40°C to +80°C
Storage temperature	-40°C to +80°C
Operating humidity	97%
Ingress protection	IP69K
Vibration	2 - 25 Hz, $\pm 1.6$ mm 25-100 Hz, a = 4 g
Shocks	a = 500 m/s <sup>2</sup>
Flash memory data retention time	10 years

### Binary inputs

Number	9 non-isolated
Input resistance	4.4 k $\Omega$
Input range	0-36 VDC
Close/Open indication	0-2 VDC close contact 6-36 VDC open contact
Minimal input signal duration	110 ms

### Binary outputs

Number	18 non-isolated
Max. continuous current (single BO)	0.5 A (BO1-BO8) 4 A (BO9-B18)
Max. continuous current (group BOs)	8x 0.5 A (BO1-BO8) 2x 3A (BO9-BO10) 2x 3A (BO11-BO12) 2x 3A (BO13-BO14) 4x 3 A (BO15-BO18)
Switching to	positive supply terminal (BO1-8, BO13-14) negative/positive supply terminal (BO9-12, BO15-18)
Maximum switching voltage	36 VDC

### Analog inputs

Number	10 non-isolated+ 3 isolated
Type	Switchable (Voltage, Resistance, Current)
Resolution	14 bits (AI1-AI13 normal mode), 10 bits (AI1 - AI4 fast mode)
Range	AI1 - AI10: 20 mA, 10 VDC, 2,5 k $\Omega$ , PT1000, $\pm 85$ mV for Isolated Thermocouples AI11 - AI12: $\pm 85$ mV for Thermocouples AI13: $\pm 70$ mV
Input impedance	150 $\Omega$ max. for mA measuring > 50 k $\Omega$ for V measuring
Accuracy	$\pm 0,25$ % of meas. value $\pm 25$ mV (10V range) $\pm 0,1$ % of meas. value $\pm 200$ $\mu$ V (AI1-AI4) $\pm 0,1$ % of meas. value $\pm 100$ $\mu$ V $\pm 0,5$ % of meas value $\pm 1$ $\Omega$ $\pm 0,25$ % of meas value $\pm 50$ $\mu$ A

### Analog outputs

Number	6
Type	Shared with Analog inputs AI5-AI10 Switchable (Voltage, Current)
Range	0 - 10 VDC / 0 - 20 mA
Resolution	16 bits
Max current/load	10 mA for 10V range
Accuracy	$\pm 0.5$ % $\pm 50$ mV out of set value $\pm 0.5$ % $\pm 100$ $\mu$ A out of set value

### Speed pick-up

Number	3+1
Input impedance	10 k $\Omega$
Voltage input range	2 Vpk-pk to 50 Veff in range 4 Hz to 4 kHz 6 Vpk-pk to 50 Veff in range 4 kHz to 10 kHz
Frequency input range	4 Hz to 10 kHz
Frequency measurement tolerance	1,5 %

### Impulse inputs

Number	2
Type of sensor	NPN
Frequency rate	0 to 300 Hz
Minimum pulse duration	1 ms
Input impedance	4 k $\Omega$
ON input voltage	< 0.8 V

OFF input voltage	> 4.2 V
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R <sub>ON</sub> max	1 kΩ
Maximum input voltage	40 V

### Auxiliary supply

Output voltage	V <sub>BAT</sub> - 2V
Max. output current	150 mA
Guaranteed level for signal	90% of supply voltage

### Speed governor output

Voltage output	± 5 VDC / max. 15 mA
PWM	450÷3000 Hz / 5V

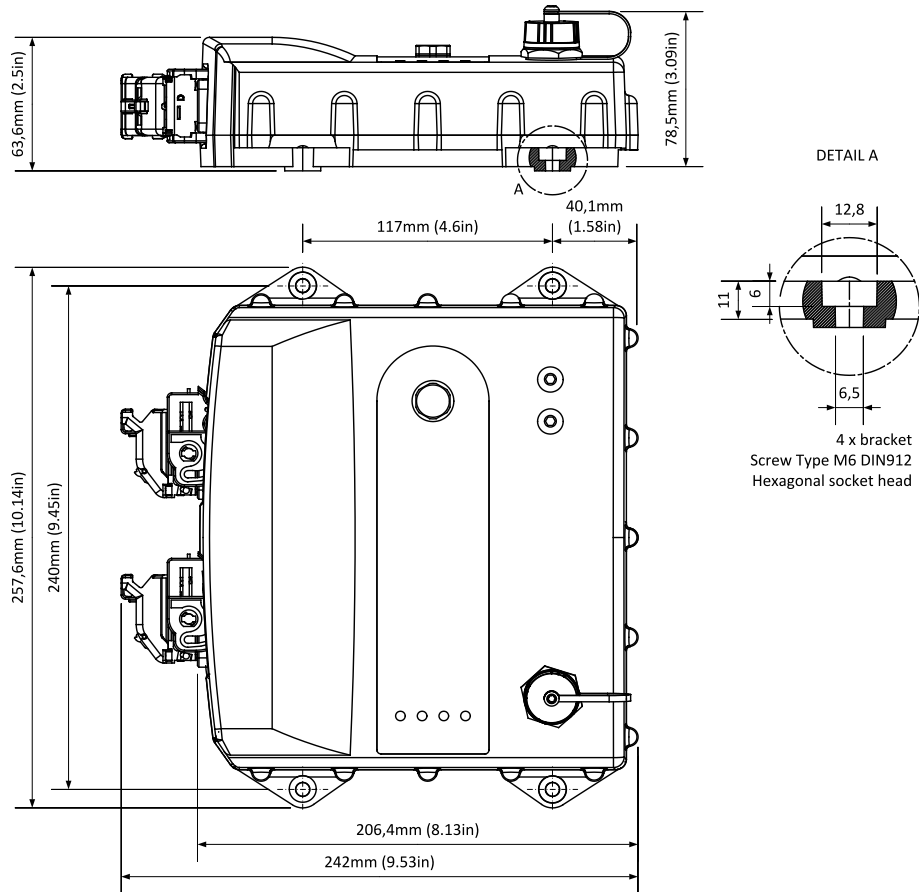
### Communications

USB port	Direct, non-isolated
RS485	Direct / Modbus; Isolated
CAN bus	CAN1 - External modules, CAN2 - Intercontroller and comm extensions Isolated

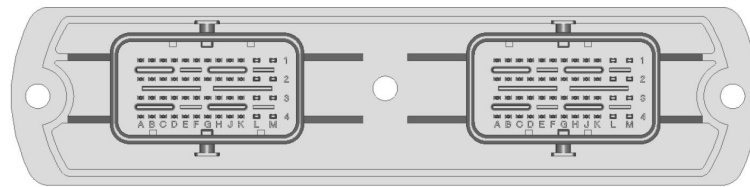
### CAN bus interface

Maximal bus length	200m (Basic setting: CAN bus mode = 32C) 900m (Basic setting: CAN bus mode = 8C)
Communication speed	250kBd (32C) 64kBd (8C)
Nominal impedance	120Ω
Nominal Velocity of Propagation	min. 75% (max. 4,4 ns/m)
Wire crosscut	min. 0,25 mm <sup>2</sup>
Maximal attenuation (at 1 MHz)	2 dB / 100m
Recommended cables	BELDEN (see <a href="http://www.belden.com">http://www.belden.com</a> ): 3105A Paired EIA Industrial RS485 cable LAPP CABLE (see <a href="http://www.lappcable.com">http://www.lappcable.com</a> ): Unitronic-FD BUS P CAN UL/CSA

## Dimensions, terminals and mounting



## Control unit terminals



Left side connector <b>BROWN</b>					Right side connector <b>BLACK</b>			
4	3	2	1		4	3	2	1
AIN1	AIN1 GND	AIN2	AIN2 GND	A	RS485A	IM3-	AIN11 TC1+	BIN5
AIN3	AIN3 GND	AIN4	AIN4 GND	B	RS-COM	IM3+	AIN11 TC1-	BIN6
AIN5/AOUT1	AIN5 GND	AIN6/AOUT2	AIN6 GND	C	RS485B	RPM 3-	AIN12 TC2+	BIN7
AIN7/AOUT3	AIN7 GND	AIN8/AOUT4	AIN8 GND	D	CAN1H	RPM 3+	AIN12 TC2-	BIN8

Left side connector <b>BROWN</b>					Right side connector <b>BLACK</b>			
AIN9/AOUT5	AIN9 GND	AIN10/AOUT6	AIN10 GND	E	CAN1-COM	RPM 2-	AIN13diff mV+	BIN9
Aux Supply	AIN +5V	AIN +5V	BIN1-4 COM	F	CAN1L	RPM 2+	AIN13diff mV-	BIN5-7 COM
IM2 +BAT	BOUT1	BIN1	BIN2	G	CAN2H	RPM 1-	BOUT5	BOUT15
IM2 -BAT	BOUT2	BIN3	BIN4	H	CAN2-COM	RPM 1+	BOUT6	BOUT16
BOUT13	BOUT3	BOUT11	BOUT9	J	CAN2L	GOV PWM	BOUT7	BOUT17
BOUT14	BOUT4	BOUT12	BOUT10	K	IM1-BAT	GOV GND	BOUT8	BOUT18
IM2 IN	COM13+14	BOUT11+12 +BAT	BOUT9+10 +BAT	L	IM1 IN	IM1 +BAT	+BAT PWR	BOUT15-18 +BAT
BOUT13+14 -BAT	BOUT13+14 +BAT	BOUT11+12 -BAT	BOUT9+10 -BAT	M	-BAT PWR	-BAT	BOUT1-8 +BAT	BOUT15-18 -BAT

Table 1.1 Left and Right connector functional layout

## Control unit installation

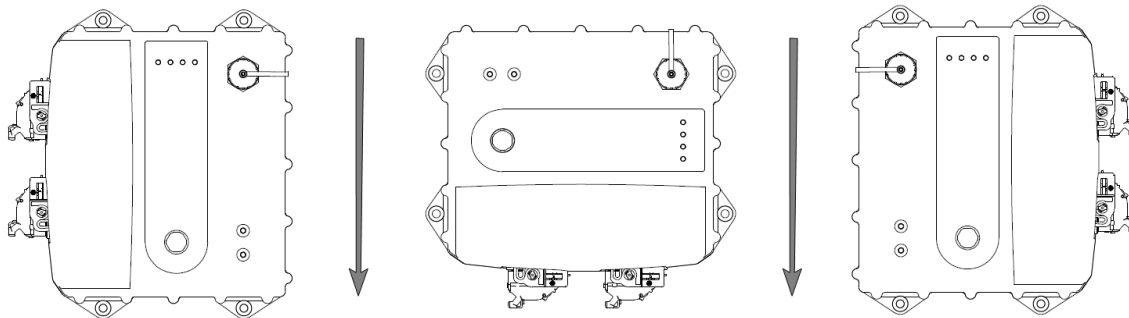


Image 1.1 Recommended installation position downwards

Disassembling	Assembling	Figure
<ol style="list-style-type: none"> <li>① Screw out 19 bolts from the bottom side of the controller case.</li> <li>② Gently divide controller cover and case.</li> <li>③ Watch the GPS/GPRS antenna, USB or module interconnections (if applicable).</li> <li>④ The silicone sealing is lubricated some lube could be present in the joint.</li> </ol>	<ol style="list-style-type: none"> <li>① Settle the silicone sealing and be sure the sealing is undamaged.</li> <li>② Fit the controller case and cover so that both parts are matching properly in joint shells.</li> <li>③ Firstly screw up all bolts but do not finalize. Finalize all bolts with the sequence a shownon figure. <b>The maximum torque is 1 Nm.</b></li> </ol>	
<p><b>Note:</b> The unit is completed with two screws for the delivery. The rest of screws are attached so the unit can be completed before applying. The main reason is to be plug-in modules (GPS, GSM, GPRS) easily applicable.</p>		



## Available extension modules

Product	Description	Order code
InteliVision 5	Color 5.6" display for monitoring and control	<a href="#">InteliVision 5 CAN</a>
InteliVision 8	Color 8" display for advanced monitoring, control & trending, USB capable	<a href="#">INTELIVISION 8</a>
InteliBifuel Denox	Knocking detector device	part of InteliBifuel kit

## Related products

Product	Description	Order code
Inteli IO8/8	8 Binary inputs, 8 Binary outputs and 2 Analog outputs packed in a small unit (HW switchable to IO16/0)	<a href="#">I-IO8/8</a>
Inteli AIN8	8 Analog inputs, only default setting available	<a href="#">I-AIN8</a>
Inteli AIN8TC	8 Thermocouple Analog inputs in a small unit	<a href="#">I-AIN8TC</a>
IS-AIN8	8 Analog inputs packed in a rugged metal unit	<a href="#">IS-AIN8</a>
IGS-PTM	8 Binary inputs, 8 Binary outputs, 4 Analog inputs and 1 Analog output in a unit	<a href="#">IGS-PTM</a>
IGL-RA15	15 Binary LED output (3 colors) packed in a rugged metal unit	<a href="#">IGL-RA15</a>
I-AOUT8	8 Analog outputs packed in a rugged metal unit	<a href="#">I-AOUT8</a>
InternetBridge-NT	Multiple Internet connections (PC and Modbus) to all controllers on CAN2 or RS485	<a href="#">IB-NT</a>
I-LB+	Direct connection (PC) to all controllers on CAN2 or RS485	<a href="#">I-LB+</a>

## Certificates and standards

<ul style="list-style-type: none"> <li>▶ EN 61010-1:95 +A1:97</li> <li>▶ EN 61000-6-2</li> <li>▶ EN 61000-6-4</li> <li>▶ ETSI EN 301489-1</li> <li>▶ EN 60068-2</li> <li>▶ EN 61000-2-6</li> <li>▶ EN 61000-2-27</li> </ul>		
	<ul style="list-style-type: none"> <li>▶ EN 61000-2-1</li> <li>▶ EN 61000-2-2</li> <li>▶ EN 61000-2-30</li> </ul>	<ul style="list-style-type: none"> <li>▶ EN 60529</li> </ul>

