



The SPN6M controller is an ECU (Electronic Control Unit) which can handle up to 32 inputs, up to 32 outputs and a redundant architecture, with two microprocessors.

Easy to program, using the ALMEClab development platform, it can be implemented in a serial line (RS232) or in a CAN network, as MASTER or SLAVE.

The polyurethane resin case makes the controllers suitable for use on machines that operate in harsh work environments.

On request the device can be supplied with E3 UNECE regulation 10 automotive certification.



TECHNICAL FEATURES

MASTER CODE	SP.6M
POWER SUPPLY	9-36 VDC / CURRENT CONSUMPTION 100 mA AT 24 VDC (STAND BY MODE)
INPUT	TOTAL No. 32 INPUTS , SOFTWARE CONFIGURABLE AS: <ul style="list-style-type: none"> • UP TO 32 DIGITAL INPUTS (HIGH SIDE) • UP TO 8 DIGITAL INPUTS (LOW SIDE) • UP TO 28 ANALOGIC INPUTS (0~40V) • UP TO 8 ANALOGIC INPUTS (4~20mA) • UP TO 4 FREQUENCY INPUTS (1~1000Hz)
OUTPUT	TOTAL No. 32 OUTPUTS , SOFTWARE CONFIGURABLE AS: <ul style="list-style-type: none"> • UP TO 16 PWM HIGH SIDE OUTPUTS • UP TO 32 HIGH SIDE OUTPUTS (MAX 2A FOR EACH OUTPUT PIN) → MAX TOTAL HIGH SIDE OUTPUTS CURRENT 10 A) • UP TO 8 DIGITAL LOW SIDE OUTPUT (MAX 500mA FOR EACH OUTPUT PIN)
CAN BUS	No. 3 PORTS: 2.0B COMPLIANT - (11, 29 BIT) - ISO 11898 - UP TO 1MBIT/S
CAN BUS PROTOCOLS	CAN OPEN (CIA DS401 DEVICE PROFILE FOR GENERIC I/O MODULE, WITH DS306 EDS FILE) ON REQUEST: SAE J1939 - FMS
SERIAL PORT	No. 2 PORTS: RS232
RTC	Not installed – see the dedicated hardware version
CONNECTION <i>See «COUPLING CONNECTORS» table</i>	MOLEX 48 PIN
CASE	PUR UL94-V0
PROTECTION	IP68
WORKING TEMPERATURE	-40°C +85°C



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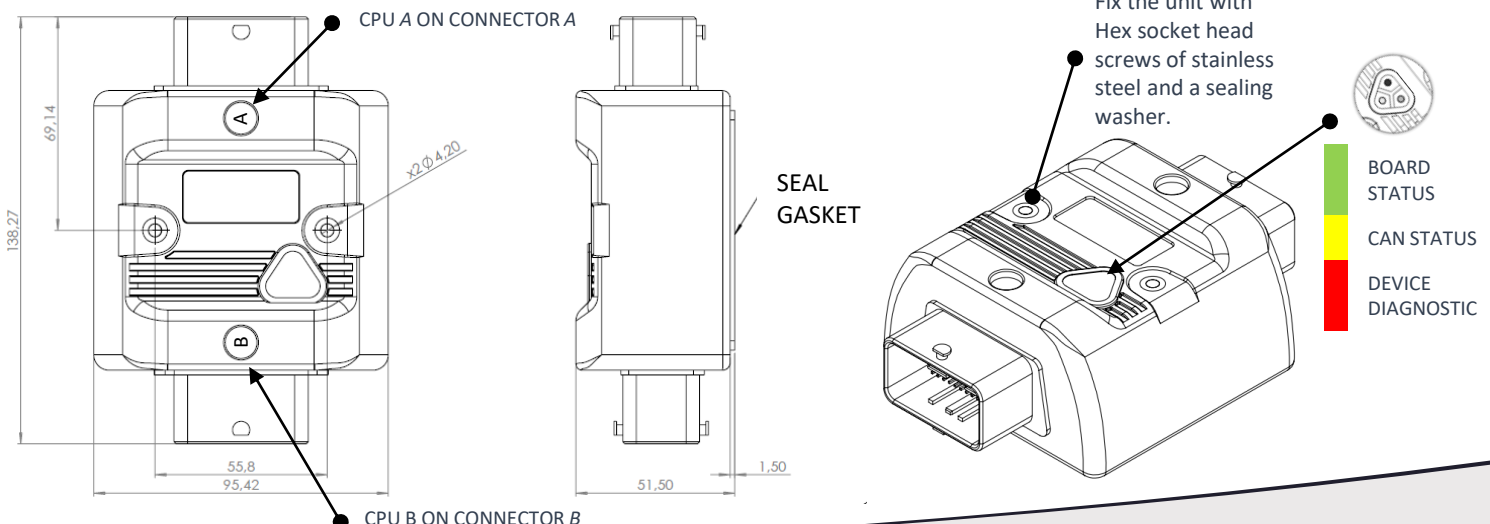
ELECTRONIC FEATURES

SLAVE USAGE	EDS FILE
MASTER USAGE	ALMEClab
	C PROGRAM OPEN SOURCE SOFTWARE
PROGRAMMING	FIRMWARE UPLOAD BY CAN BUS WITH ALOADER SOFTWARE TOOL
CYCLE TIME	Less than 2 ms
CPU	FAMILY: ARM CORTEX M4, 32BIT CORE
MEMORY	FLASH (PROGRAM MEMORY): 1MB RAM MEMORY: 256KB EEPROM: 128KB

STANDARDS

ELECTROMAGNETIC EMISSIONS	EN 61000-6-4
ELECTROMAGNETIC IMMUNITY	EN 61000-6-2
ROAD VEHICLES — ELECTRICAL DISTURBANCES FROM CONDUCTION AND COUPLING — PART 2	ISO 7637-2: 2011
ROAD VEHICLES — COMPONENT TEST METHODS FOR ELECTRICAL DISTURBANCES FROM NARROWBAND RADIATED ELECTROMAGNETIC ENERGY — PART 1	ISO 11452-1: 2005
VERIFICATIONS AND TESTS PERFORMED ACCORDING TO THE REQUIREMENTS OF UNECE REGULATION 10 - AMENDMENT 06 - SUPPLEMENT 0	On request: E3 – TYPE APPROVAL
MTTFd CALCULATED ACCORDING TO THE IEC61709 (SIEMENS SN29500), WITH ENVIRONMENTAL FACTORS 3K7 (IEC60721)	MOSFET OUTPUT: 151,35 YEARS INPUT ONLY: 162,33 YEARS
PERFORMANCE AND SAFETY INTEGRITY LEVEL	PLd – SIL2 (DUAL-CHANNEL INTERNAL SCHEME)

SIZE (mm)





48 PINS CONNECTOR

A

PIN	A	B	C	D	E	F	G	H	J	K	L	M
1	DIGITAL / PWM OUTPUT 13	SUPPLY OUTPUTS 9...16	DIGITAL / PWM OUTPUT 12	DIGITAL / PWM OUTPUT 11	DIGITAL / PWM OUTPUT 10	DIGITAL / PWM OUTPUT 9	GND POWER SUPPLY	DIGITAL OUTPUT 8	DIGITAL OUTPUT 7	DIGITAL OUTPUT 6	SUPPLY OUTPUTS 1...8	DIGITAL OUTPUT 4
2	DIGITAL / PWM OUTPUT 14	INPUT 9 0...40Vdc / DIGITAL	INPUT 8 0...40Vdc / DIGITAL	INPUT 7 0...40Vdc / DIGITAL	INPUT 6 4...20mA / 0...40Vdc / DIGITAL	INPUT 5 4...20mA / 0...40Vdc / DIGITAL	INPUT 4 4...20mA / 0...40Vdc / DIGITAL	INPUT 3 4...20mA / 0...40Vdc / DIGITAL	INPUT 2 0...40Vdc / DIGITAL	INPUT 1 0...40Vdc / DIGITAL	DIGITAL OUTPUT 5	DIGITAL OUTPUT 3
			DIGITAL LS OUTPUT 8 500 mA	DIGITAL LS OUTPUT 7 500 mA	DIGITAL LS OUTPUT 6 30 mA	DIGITAL LS OUTPUT 5 30 mA	DIGITAL LS OUTPUT 4 30 mA	DIGITAL LS OUTPUT 3 30 mA	DIGITAL LS OUTPUT 2 500 mA	DIGITAL LS OUTPUT 1 500 mA		
3	DIGITAL / PWM OUTPUT 15	INPUT 10 0...40Vdc / DIGITAL	FREQ. / DIGITAL INPUT 11	FREQ. / DIGITAL INPUT 12	INPUT 13 0...40Vdc / DIGITAL	INPUT 14 0...40Vdc / DIGITAL	INPUT 15 0...40Vdc / DIGITAL	INPUT 16 0...40Vdc / DIGITAL	CAN2(H) / RS232 1 RX *	CAN2(L) / RS232 1 TX *	GND POWER SUPPLY	DIGITAL OUTPUT 2 / CAN2(L) *
4	DIGITAL / PWM OUTPUT 16	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	GND	GND	GND	CAN H	CAN L	MODULE POWER SUPPLY	GND	DIGITAL OUTPUT 1 / CAN2(H) *

48 PINS CONNECTOR

B

PIN	A	B	C	D	E	F	G	H	J	K	L	M
1	DIGITAL / PWM OUTPUT 29	SUPPLY OUTPUTS 25...32	DIGITAL / PWM OUTPUT 28	DIGITAL / PWM OUTPUT 27	DIGITAL / PWM OUTPUT 26	DIGITAL / PWM OUTPUT 25	GND POWER SUPPLY	DIGITAL OUTPUT 24	DIGITAL OUTPUT 23	DIGITAL OUTPUT 22	SUPPLY OUTPUTS 17...24	DIGITAL OUTPUT 20
2	DIGITAL / PWM OUTPUT 30	INPUT 25 0...40Vdc / DIGITAL	INPUT 24 0...40Vdc / DIGITAL	INPUT 23 0...40Vdc / DIGITAL	INPUT 22 4...20mA / 0...40Vdc / DIGITAL	INPUT 21 4...20mA / 0...40Vdc / DIGITAL	INPUT 20 4...20mA / 0...40Vdc / DIGITAL	INPUT 19 4...20mA / 0...40Vdc / DIGITAL	INPUT 18 0...40Vdc / DIGITAL	INPUT 17 0...40Vdc / DIGITAL	DIGITAL OUTPUT 21	DIGITAL OUTPUT 19
			DIGITAL LS OUTPUT 24 500 mA	DIGITAL LS OUTPUT 23 500 mA	DIGITAL LS OUTPUT 22 30 mA	DIGITAL LS OUTPUT 21 30 mA	DIGITAL LS OUTPUT 20 30 mA	DIGITAL LS OUTPUT 19 30 mA	DIGITAL LS OUTPUT 18 500 mA	DIGITAL LS OUTPUT 17 500 mA		
3	DIGITAL / PWM OUTPUT 31	INPUT 26 0...40Vdc / DIGITAL	FREQ. / DIGITAL INPUT 27	FREQ. / DIGITAL INPUT 28	INPUT 29 0...40Vdc / DIGITAL	INPUT 30 0...40Vdc / DIGITAL	INPUT 31 0...40Vdc / DIGITAL	INPUT 32 0...40Vdc / DIGITAL	CAN3(H) / RS232 2 RX *	CAN3(L) / RS232 2 TX *	GND POWER SUPPLY	DIGITAL OUTPUT 18 / CAN3(L) *
4	DIGITAL / PWM OUTPUT 32	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	GND	GND	GND	CANH	CANL	MODULE POWER SUPPLY	GND	DIGITAL OUTPUT 17 / CAN3(H) *

NOTES:

- «FREQ» means «frequency» - «LS» MEANS «LOW SIDE»
- For digital low side outputs : **low side can't be used if the relative input is used**
- (*) : pin shared with different functions, see the pin configuration based on hardware configuration table
- Sensor power pins have the reference power supply voltage, MAX 200mA
- GND pins are connected together

TERMINAL WIRE SIZE: follow the manufacturer's mating connector specification

- from A1 to J4: 0.75 mm²
- from L1 to M4: 2.0 mm²

HARDWARE CONFIGURATION

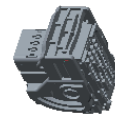
S01	Nr. 3 CAN PORT
S02	Nr. 2 CAN PORT (on shared pins) Nr. 1 RS232 PORT (on shared pins)
S03	Nr. 1 CAN PORT (on shared pins) Nr. 2 RS232 PORT (on shared pins)
S04	Nr. 3 CAN PORT (on shared pins) Nr. 2 RS232 PORT (on shared pins)

MATING CONNECTORS – MOLEX CODES

CONNECTOR	64320-3311
TERMINALS	64323-1029 (x8) 64322-1029 (x40)
WIRE CAP	64320-1301
ALMEC PRE-WIRED CONNECTOR	CNN.ML.48P.R.VD.CB (red cable) CNN.ML.48P.B.VD.CB (blue cable)



CNN.ML.48P.R.VD.CB
CNN.ML.48P.B.VD.CB



64320-3311



64323-1029



64322-1029



64320-1301



ALMEC
MECHATRONICS

NOTE