ALMEC MECHATRONICS

SPN5 | CONTROLLER

- ECU which can handle up to 24 inputs and up to 20 outputs
- PIC high-performance microprocessor
- Freely programmable using open-source environment in C language
- Output current measurement
- Integrated dry contact relay
- Implementable in a CAN network as MASTER or SLAVE unit
- Polyurethane resin case

TECHNICAL FEATURES	
MASTER CODE	SPN.5.466
POWER SUPPLY	9-36 VDC / CURRENT ABSORPTION 50 mA AT 24 VDC (STAND BY MODE)
INPUT	**TOTAL No. 24 INPUTS**: • UP TO 8 UNIVERSAL INPUTS, SOFTWARE CONFIGURABLE AS ❑ 4 ÷ 20 mA ❑ 0 ÷ 36 V ❑ High side ❑ Low side ❑ Frequency pulse counter • UP TO 16 DIGITAL INPUT ❑ NPN ❑ PNP
OUTPUT	**RELAY VERSION:** TOTAL No. 16 OUTPUTS • UP TO 12 PWM HIGH SIDE OUTPUTS ❑ ECU MAX CURRENT: 20 A ❑ SINGLE OUTPUT MAX CURRENT: 5 A • UP TO 4 RELAY NO CONTACT ❑ SINGLE OUTPUT MAX CURRENT: 3 A **MOSFET VERSION:** TOTAL No. 20 OUTPUTS • UP TO 12 PWM HIGH SIDE OUTPUTS ❑ ECU MAX CURRENT: 20 A ❑ SINGLE OUTPUT MAX CURRENT: 5 A • UP TO 8 DIGITAL HIGH SIDE OUTPUTS ❑ SINGLE OUTPUT MAX CURRENT: 3 A
CAN BUS	No. 1 PORT: 2.0B COMPLIANT - (11, 29 BIT) - ISO 11898 - UP TO 1MBIT/S *OPTIONAL:* + 1 PORT PROTOCOL: CAN OPEN (CIA DS401 DEVICE PROFILE FOR GENERIC I/O MODULE, WITH DS306 EDS FILE) ON REQUEST: SAE J1939 - ISO 11783 (ISO BUS) - FMS
OPTIONAL **RTC**	Internal buffer battery for real-time clock (time and date) keeping up to 10 year
CONNECTION *See «MATING CONNECTORS» table*	MOLEX 32 PIN MOLEX 48 PIN
CASE	ENCAPSULATED IN PUR RESIN - SELF-EXTINGUISHING UL94 (V0)
WORKING TEMPERATURE	-40°C + 80°C

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ELECTRONIC FEATURES	
SLAVE USAGE	EDS FILE
MASTER USAGE	STANDARD C PROGRAM LANGUAGE
PROGRAMMING	FIRMWARE UPLOAD BY CAN BUS WITH ALOADER SOFTWARE TOOL
CPU	PIC 16 bit
INTERNAL MEMORY	FLASH: 192 KB (PROGRAM MEMORY: 164 KB) RAM MEMORY: 28 KB EEPROM external: 1024 KB On request: F-RAM 128 KB x 8

STANDARDS	
DIRECTIVE	2014/30/EU (EMC)
ELECTROMAGNETIC COMPATIBILITY	EN 50498
ELECTROMAGNETIC EMISSIONS	EN 61000-6-4
ELECTROMAGNETIC IMMUNITY	EN 61000-6-2
ROAD VEHICLES	ISO 7637-2: 2011 ISO 11452-1: 2005
PERFORMANCE AND SAFETY INTEGRITY LEVEL	PLc – SIL1 (SINGLE-CHANNEL INTERNAL SCHEME)
ENVIRONAMENT	IEC 60529 (IP67) IEC 60068-2-1:2008-11 IEC 60068-2-2:2008-11 IEC 60068-2-78:2013-11 IEC 60068-2-27:2008 IEC 60068-2-6:2007

FEATURES

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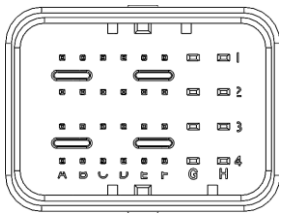
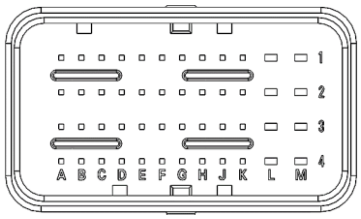


32 PINS CONNECTOR (A)

PIN	A	B	C	D	E	F	G	H
1	DIGITAL / PWM OUTPUT 2	DIGITAL / PWM OUTPUT 3	SUPPLY OUTPUTS 3/4	DIGITAL / PWM OUTPUT 4	DIGITAL INPUT 9	GND	DIGITAL / PWM OUTPUT 5	SUPPLY OUTPUTS 5/6
	DIGITAL / PWM OUTPUT 2	DIGITAL / PWM OUTPUT 3	SUPPLY OUTPUTS 3/4	DIGITAL / PWM OUTPUT 4	DIGITAL INPUT 9	GND	DIGITAL / PWM OUTPUT 5	SUPPLY OUTPUTS 5/6
2	SUPPLY OUTPUTS 1/2	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	GND	GND	GND	GND
	SUPPLY OUTPUTS 1/2	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	GND	GND	GND	GND
3	DIGITAL / PWM OUTPUT 1	DIGITAL INPUT 5	DIGITAL INPUT 4	DIGITAL INPUT 3	DIGITAL INPUT 2	DIGITAL INPUT 1	GND	DIGITAL / PWM OUTPUT 6
	DIGITAL / PWM OUTPUT 1	DIGITAL INPUT 5	DIGITAL INPUT 4	DIGITAL INPUT 3	DIGITAL INPUT 2	DIGITAL INPUT 1	GND	DIGITAL / PWM OUTPUT 6
4	DIGITAL INPUT 6	DIGITAL INPUT 7	DIGITAL INPUT 8	DIGITAL HIGH SIDE OUTPUT 13A	DIGITAL HIGH SIDE OUTPUT 13	DIGITAL HIGH SIDE OUTPUT 14A	DIGITAL HIGH SIDE OUTPUT 14	SUPPLY OUTPUTS 13/13A 14/14A
	DIGITAL INPUT 6	DIGITAL INPUT 7	DIGITAL INPUT 8	FREE CONTACT OUTPUT 13	FREE CONTACT OUTPUT 13	NOT USED	FREE CONTACT OUTPUT 14	FREE CONTACT OUTPUT 14



48 PINS CONNECTOR (B)

PIN	A	B	C	D	E	F	G	H	J	K	L	M
1	DIGITAL HIGH SIDE OUTPUT 16A	SUPPLY OUTPUTS 15/15A/16/16A	SENSOR POWER SUPPLY	DIGITAL /PWM OUTPUT 7	SUPPLY OUTPUTS 7/8	DIGITAL / PWM OUTPUT 8	GND	DIGITAL / PWM OUTPUT 9	GND	SUPPLY OUTPUTS 9/10	GND	DIGITAL / PWM OUTPUT 10
	FREE CONTACT OUTPUT 16	FREE CONTACT OUTPUT 15	SENSOR POWER SUPPLY	DIGITAL /PWM OUTPUT 7	SUPPLY OUTPUTS 7/8	DIGITAL / PWM OUTPUT 8	GND	DIGITAL / PWM OUTPUT 9	GND	SUPPLY OUTPUTS 9/10	GND	DIGITAL / PWM OUTPUT 10
2	DIGITAL HIGH SIDE OUTPUT 16	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	GND	GND	GND	GND	GND	GND	DIGITAL / PWM OUTPUT 11
	FREE CONTACT OUTPUT 16	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	GND	GND	GND	GND	GND	GND	DIGITAL / PWM OUTPUT 11
3	DIGITAL HIGH SIDE OUTPUT 15	DIGITAL INPUT 10	DIGITAL INPUT 11	DIGITAL INPUT 12	DIGITAL INPUT 13	DIGITAL INPUT 14	DIGITAL INPUT 15	DIGITAL INPUT 16	CANH	CANL	GND	SUPPLY OUTPUTS 11/12
	NOT USED	DIGITAL INPUT 10	DIGITAL INPUT 11	DIGITAL INPUT 12	DIGITAL INPUT 13	DIGITAL INPUT 14	DIGITAL INPUT 15	DIGITAL INPUT 16	CANH	CANL	GND	SUPPLY OUTPUTS 11/12
4	DIGITAL HIGH SIDE OUTPUT 15A	ANALOGIC INPUT 1	LOGIC POWER SUPPLY	ANALOGIC INPUT 2	ANALOGIC INPUT 3	ANALOGIC INPUT 4	ANALOGIC INPUT 5	ANALOGIC INPUT 6	ANALOGIC INPUT 7	ANALOGIC INPUT 8	GND	DIGITAL / PWM OUTPUT 12
	FREE CONTACT OUTPUT 15	ANALOGIC INPUT 1	LOGIC POWER SUPPLY	ANALOGIC INPUT 2	ANALOGIC INPUT 3	ANALOGIC INPUT 4	ANALOGIC INPUT 5	ANALOGIC INPUT 6	ANALOGIC INPUT 7	ANALOGIC INPUT 8	GND	DIGITAL / PWM OUTPUT 12

NOTES:

- Sensor power pins have the reference power supply voltage, MAX 500mA
- GND pins are connected togheder

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

- All pins: 0.75 mm²
- Pins indicated on the last two columns: 2.0 mm²

OUTPUT CONFIGURATION		
SPN.5.466.2	MOSFET VERSION	
SPN.5.466.3	RELAY VERSION	

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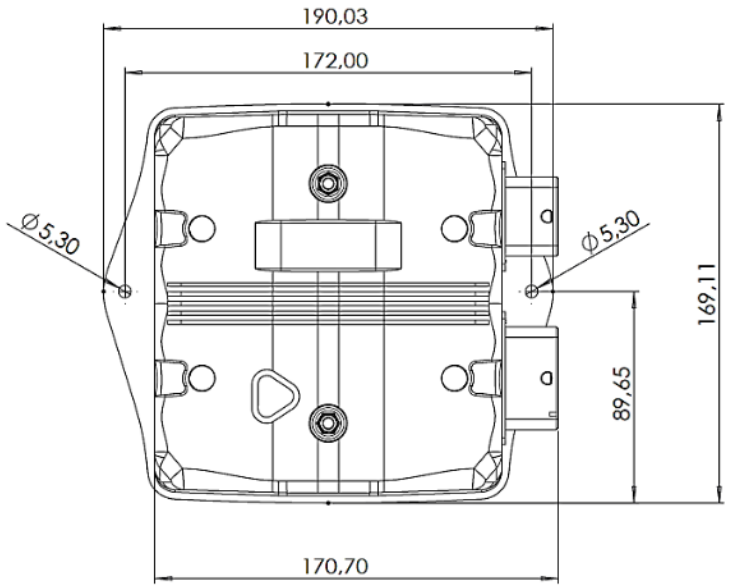
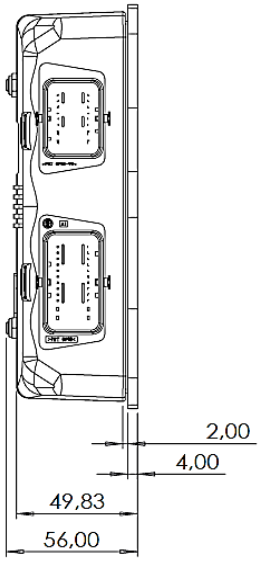
SIZE (mm)





MATING CONNECTORS – MOLEX CODES

CONNECTOR	64320-3311 64319-3211
TERMINALS	64323-1029 (x8) 64322-1029 (x24)
WIRE CAP	64320-1301 64320-1201
ALMEC PRE-WIRED CONNECTOR	CNN.ML.48P (yellow/blue cable) CNN.ML.32P (red/green cable)


64320-3311
64319-3211


64323-1029


64322-1029


64320-1301

PWM HS OUTPUT FEATURES

PWM FREQUENCY	10 ÷ 500 Hz
INTEGRATED CURRENT MEASURE	I < 200mA — Error = 20% 200mA < I < 300mA — Error = 10% 300mA < I < 500mA — Error = 5% 500mA < I < 5000mA — Error = 1%
SET	DIGITAL ON OFF OPEN LOOP (PWM VOLTAGE) CLOSED LOOP (CURRENT CONTROL)

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NOTE