



The SPN9 controller is an ECU (Electronic Control Unit) which can handle up to 48 inputs and up to 40 outputs.

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.



TECHNICAL FEATURES

MASTER CODE		SPN9	
POWER SUPPLY		9-36 VDC / CURRENT CONSUMPTION 60 mA AT 24 VDC (STAND BY MODE)	
INPUT	TOTAL 48	MAX 16 ANALOGIC INPUT WITH 0..40 V and 4..20 mA CAPABILITY	RESOLUTION FOR 0..40V INPUT: 10mV
		MAX 16 ANALOGIC INPUT WITH 0..40 V CAPABILITY	RESOLUTION FOR 4..20mA INPUT: 20uA
		MAX 12 OPTO-COUPLED DIGITAL HIGH/LOW SIDE INPUTS	FREQUENCY RANGE FOR COUNTER (1-1000Hz)
		MAX 4 OPTO-COUPLED DIGITAL HIGH SIDE INPUTS WITH PULSE COUNTER	THRESHOLD FOR DIGITAL IN: SW CONFIGURABLE
OUTPUT	TOTAL 40	MAX 24 DIGITAL / PWM OPEN-LOOP / CURRENT CLOSED LOOP	OUTPUT CURRENT MAX: 4A
		MAX 8 DIGITAL / PWM OPEN-LOOP / CURRENT CLOSED LOOP SAFETY	TOTAL CURRENT MAX: 16A
		MAX 8 DIGITAL HIGH SIDE LOW CURRENT OUTPUTS	LOW CURRENT OUTPUT CURRENT: 2A
CAN BUS	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	
SERIAL PORT	1 PORT	RS232	
RTC		YES: ON REQUEST	
WI-FI		ON REQUEST: IEEE802.11 b/g/n	

NEXT PAGE FOLLOWS





TECHNICAL FEATURES

CONNECTION	4	2 MOLEX 32 PIN
		2 MOLEX 48 PIN
WORKING TEMPERATURE		-40°C + 85°C
CASE		PUR

ELECTRONIC FEATURES

SLAVE USAGE	EDS FILE
MASTER USAGE	ALMEClab
	STANDARD C PROGRAM LANGUAGE
PROGRAMMING	FIRMWARE UPLOAD BY CAN BUS WITH ALOADER SOFTWARE TOOL
CYCLE TIME	1 ms
CPU	FAMILY: ARM CORTEX M4 32 bit CORE
INTERNAL MEMORY	FLASH: 1 MB (optional 512 MB with external chip) RAM: 128 KB

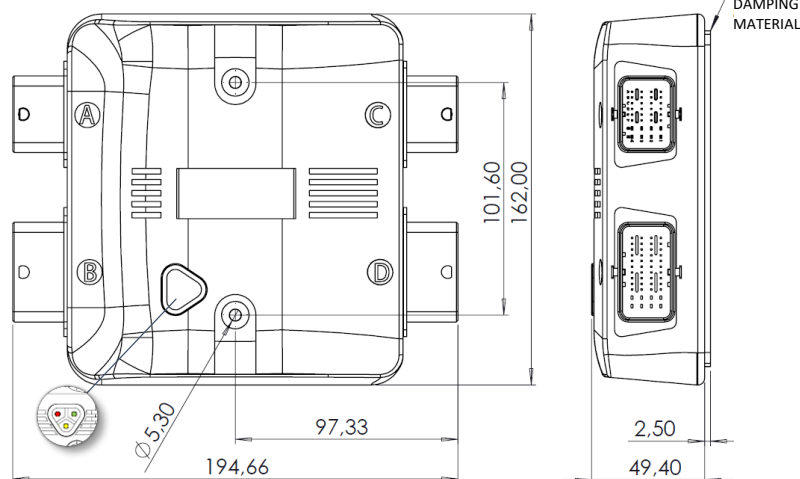
STANDARDS

ELECTROMAGNETIC EMISSIONS	EN 61000-6-4// EN 55011 (RF RADIATE)
ELECTROMAGNETIC IMMUNITY	EN 61000-6-2// EN 61000-4-2/3/4/6
IP	BOX: IP68; CONNECTORS: IP67
MTTFd	115,34 YEARS CALCULATED ACCORDING TO THE IEC61709 (SIEMENS SN29500), WITH ENVIRONMENTAL FACTORS 3K7 (IEC60721)
PERFORMANCE AND SAFETY INTEGRITY LEVEL	PLd – SIL2 (DUAL-CHANNEL INTERNAL SCHEME)

IN ACCORDANCE WITH THE EN50498 THE DEVICE MEETS THE TECHNICAL SPECIFIC REQUIREMENTS OF 2004-104 DIRECTIVE (AUTOMOTIVE). THE DEVICE IS EMC 2004/108 COMPLIANT.

SIZE (mm)

- BOARD / APPLICATION STATUS
- CAN STATUS
- BOARD DIAGNOSTIC (256 DISPOSABLE CODE MANAGE FROM PLC)





VERSION PORT AVAILABLE

RELAY + DIGITAL OUTPUTS	UP TO 24 PWM UP TO 8 RELAY
ALL DIGITAL OUTPUTS	UP TO 24 PWM UP TO 16 DIGITAL (HIGH SIDE)

OTHER CUSTOMIZATIONS ARE AVIABLE ON REQUEST

COUPLING CONNECTORS

	32 PIN	48 PIN
CONNECTOR	64319-3211	64320-3311
TERMINAL	64323-1029 (x8) 64322-1029 (x24)	64323-1029 (x8) 64322-1029 (x40)
WIRE CAP	64319-1201	64320-1301



CONNECTOR **A**
32 PINS

CONNECTOR **C**
32 PINS

CONNECTOR **B**
48 PINS

CONNECTOR **D**
48 PINS



ALL DIGITAL OUTPUTS RELAY + DIGITAL OUTPUTS

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 12 / SERIAL TX*	DIGITAL INPUT 12 / SERIAL RX*	DIGITAL INPUT 13	DIGITAL INPUT 14	DIGITAL INPUT 15 / CAN2H*	DIGITAL INPUT 16 / CAN2L*	CANH	CANL	GND	SUPPLY OUTPUTS 11/12
	NOT USED	DIGITAL INPUT 10	DIGITAL INPUT 11 / SERIAL TX*	DIGITAL INPUT 12 / SERIAL RX*	DIGITAL INPUT 13	DIGITAL INPUT 14	DIGITAL INPUT 15 / CAN2H*	DIGITAL INPUT 16 / CAN2L*	CANH	CANL	GND	SUPPLY OUTPUTS 11/12
4	DIGITAL HIGH SIDE OUTPUT 15A	ANALOG INPUT 1	LOGIC POWER SUPPLY	ANALOG INPUT 2	ANALOG INPUT 3	ANALOG INPUT 4	ANALOG INPUT 5	ANALOG INPUT 6	ANALOG INPUT 7	ANALOG INPUT 8	GND	DIGITAL / PWM OUTPUT 12
	FREE CONTACT OUTPUT 15	ANALOG INPUT 1	LOGIC POWER SUPPLY	ANALOG INPUT 2	ANALOG INPUT 3	ANALOG INPUT 4	ANALOG INPUT 5	ANALOG INPUT 6	ANALOG INPUT 7	ANALOG INPUT 8	GND	DIGITAL / PWM OUTPUT 12

32 PINS CONNECTOR **C**

PIN	A	B	C	D	E	F	G	H
1	DIGITAL / PWM OUTPUT 18	DIGITAL / PWM OUTPUT 19	SUPPLY OUTPUTS 19/20	DIGITAL / PWM OUTPUT 20	DIGITAL INPUT 25	GND	DIGITAL / PWM OUTPUT 21	SUPPLY OUTPUTS 21/22
	DIGITAL / PWM OUTPUT 18	DIGITAL / PWM OUTPUT 19	SUPPLY OUTPUTS 19/20	DIGITAL / PWM OUTPUT 20	DIGITAL INPUT 25	GND	DIGITAL / PWM OUTPUT 21	SUPPLY OUTPUTS 21/22
2	SUPPLY OUTPUTS 17/18	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	GND	GND	GND	GND
	SUPPLY OUTPUTS 17/18	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	GND	GND	GND	GND
3	DIGITAL / PWM OUTPUT 17	DIGITAL INPUT 21	DIGITAL INPUT 20	DIGITAL INPUT 19	DIGITAL INPUT 18	DIGITAL INPUT 17	GND	DIGITAL / PWM OUTPUT 22
	DIGITAL / PWM OUTPUT 17	DIGITAL INPUT 21	DIGITAL INPUT 20	DIGITAL INPUT 19	DIGITAL INPUT 18	DIGITAL INPUT 17	GND	DIGITAL / PWM OUTPUT 22
4	DIGITAL INPUT 22	DIGITAL INPUT 23	DIGITAL INPUT 24	DIGITAL HIGH SIDE OUTPUT 29A	DIGITAL HIGH SIDE OUTPUT 29	DIGITAL HIGH SIDE OUTPUT 30A	DIGITAL HIGH SIDE OUTPUT 30	SUPPLY OUTPUTS 29/29A/30/30A
	DIGITAL INPUT 22	DIGITAL INPUT 23	DIGITAL INPUT 24	FREE CONTACT OUTPUT 29	FREE CONTACT OUTPUT 29	NOT USED	FREE CONTACT OUTPUT 30	FREE CONTACT OUTPUT 30

48 PINS CONNECTOR **D**

PIN	A	B	C	D	E	F	G	H	J	K	L	M
1	DIGITAL HIGH SIDE OUT 32A	SUPPLY OUTPUTS 31/31A/32/32A	SENSOR POWER SUPPLY	DIGITAL / PWM OUTPUT 23	SUPPLY OUTPUTS 23/24	DIGITAL / PWM OUTPUT 24	GND	DIGITAL / PWM OUTPUT 25	GND	SUPPLY OUTPUTS 25/26	GND	DIGITAL / PWM OUTPUT 26
	FREE CONTACT OUT 32	FREE CONTACT OUT 31	SENSOR POWER SUPPLY	DIGITAL / PWM OUTPUT 23	SUPPLY OUTPUTS 23/24	DIGITAL / PWM OUTPUT 24	GND	DIGITAL / PWM OUTPUT 25	GND	SUPPLY OUTPUTS 25/26	GND	DIGITAL / PWM OUTPUT 26
2	DIGITAL HIGH SIDE OUT 32	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	GND	GND	GND	GND	GND	GND	DIGITAL / PWM OUTPUT 27
	FREE CONTACT OUT 32	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	GND	GND	GND	GND	GND	GND	DIGITAL / PWM OUTPUT 27
3	DIGITAL HIGH SIDE OUTPUT 31	DIGITAL INPUT 26	DIGITAL INPUT 27	DIGITAL INPUT 28	DIGITAL INPUT 29	DIGITAL INPUT 30	DIGITAL INPUT 31	DIGITAL INPUT 32	CANH	CANL	GND	SUPPLY OUTPUTS 27/28
	NOT USED	DIGITAL INPUT 26	DIGITAL INPUT 27	DIGITAL INPUT 28	DIGITAL INPUT 29	DIGITAL INPUT 30	DIGITAL INPUT 31	DIGITAL INPUT 32	CANH	CANL	GND	SUPPLY OUTPUTS 27/28
4	DIGITAL HIGH SIDE OUTPUT 31A	ANALOG INPUT 9	LOGIC POWER SUPPLY	ANALOG INPUT 10	ANALOG INPUT 11	ANALOG INPUT 12	ANALOG INPUT 13	ANALOG INPUT 14	ANALOG INPUT 15	ANALOG INPUT 16	GND	DIGITAL / PWM OUTPUT 28
	FREE CONTACT OUTPUT 31	ANALOG INPUT 9	LOGIC POWER SUPPLY	ANALOG INPUT 10	ANALOG INPUT 11	ANALOG INPUT 12	ANALOG INPUT 13	ANALOG INPUT 14	ANALOG INPUT 15	ANALOG INPUT 16	GND	DIGITAL / PWM OUTPUT 28

*PIN CONFIGURATION BASED ON THE DEVICE VERSION





ALMEC
MECHATRONICS

NOTE