



Converter CAN-bus / Inputs (6x voltage, 1x resistance, DM1)

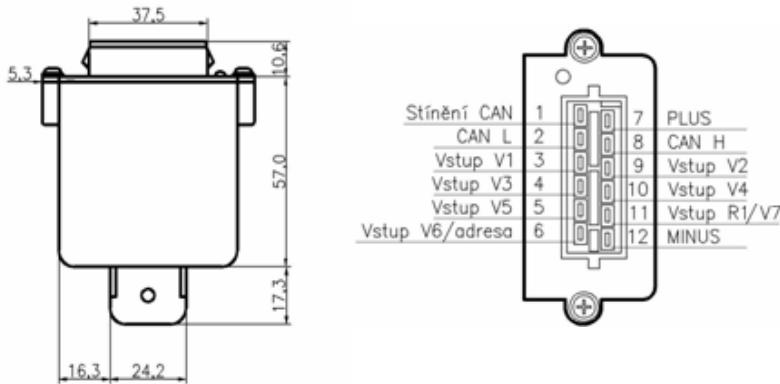
The converter is used in commercial vehicles and mobile machinery:

- to transfer signals from analog sensors (pressures, temperatures, fuel supply...) and state switches to CAN-bus messages
- to simplify the implementation of an on-board diagnostics DM1 according to SAE J1939.

The converter measures current values of 6 voltage inputs and 1 resistance input. It transmits detected values in two CAN-bus messages periodically. In one message also the current value of supply voltage is transmitted. One version of a standard firmware interprets one of voltage inputs as an "address" - it enables to connect 4 converters on one CAN-bus (customization of the firmware is needless).

DTCs (Diagnostic Trouble Codes) from all diagnostic messages DM1 (it means "single" and also multi-packet messages) are saved in a memory of the converter. The information about a state of diagnostic lamps the most important aggregates and one selected DTC are transmitted in a periodical "single" message. Transmitting other DTCs can be switched by a user's message.

Labelling	CANI_V6R1_DM1, CANI_V6R1
Application fields	Buses, trucks, mobile machinery
Certificate	EC type-approval of a type separate technical unit with regard to Directive 72/245/EEC as last amended by 2006/96/EC (electromagnetic compatibility); made by TÜV SÜD Auto CZ EC type-approval mark: e8
Environment	Working temperature range -30 - +85°C Relative humidity up to 90% IP 42 Vibration resistance up to 5 g
Housing	Plastic box with a flange for fixing by a screw Tyco Junior Timer housing 827229-1,12x male contact 963901-1 counterpart for connecting: Housing 827603-1, female contact 925596-1
Power supply	+9 . +32 V DC
Indication	Green LED blinking
Inputs	voltage 0 . 5 V (permanently overloaded $U_{max} = U_{BAT}$) resistance 0 . 100 ($I_{ef} = 5 \text{ mA}$, $I_{peak} = 50 \text{ mA}$) multiplexing A/D converter 10 bits, linear conversion on an interval 0 . 1000 address 3 states: MINUS, PLUS, UNPLUGGE
CAN-bus	according to ISO 11898 When CAN-bus communication is interrupted after 5 s delay, the converter resets.
Firmware	6.4 addressable, without DM1 7.7 non-addressable, without DM1 9.5 non-addressable, including DM1
Related products	CAN-bus/Outputs converter, Outdoor temperature sensor, KIBES CAN-bus/Tachograph sensor converter, UCINT
Customization	Firmware modification (message identifiers, CAN-bus rate...)


Firmware 6.4
Inputs 5x voltage, 1x resistance, 1x address

Address Controlled by voltage on pin 6.

Address is set during auto-configuration 500 ms after turning on power supply.

CAN-bus 250 kbps

Message 1 CANI_1			Direction	Period	Length
<i>Identifier depends on the Address value:</i>			if MINUS	100 ms	8
			if PLUS	18 01 01 F8	
			if UNPLUGGED	18 02 01 F8	
				18 03 01 F8	
Start	Range	Quantity	<i>Coding</i>		
B1	2 bytes	Supply voltage	0.1 V/bit, 0 offset		
B3	2 bytes	Input V1	0.005 V/bit, 0 offset		
B5	2 bytes	Input V2	0.005 V/bit, 0 offset		
B7	2 bytes	Input V3	0.005 V/bit, 0 offset		
Message 2 CANI_2			Direction	Period	Length
<i>Identifier depends on the Address value:</i>			if MINUS	100 ms	8
			if PLUS	18 01 02 F8	
			if UNPLUGGED	18 02 02 F8	
				18 03 02 F8	
Start	Range	Quantity	<i>Coding</i>		
B1	2 bytes	Input V4	0.005 V/bit, 0 offset		
B3	2 bytes	Input V5	0.005 V/bit, 0 offset		
B5	2 bytes	Input R1	0.1 /bit, 0 offset		

Firmware 7.7
Inputs 6x voltage, 1x resistance

CAN-bus 250 kbps

Message 1 CANI_1		Direction	Identifier	Period	Length
<i>Data field</i>		Tx	18 04 01 F8	100 ms	8
<i>Data field</i>		same as firmware 6.4			
Message	Start	Range	Direction	Identifier	Period
CANI_2			Tx	18 04 02 F8	100 ms
			Quantity		8
	B1	same as firmware 6.4			
	B3	same as firmware 6.4			
	B5	same as firmware 6.4			
	B7	2 bytes	Input V6		
				0.005 V/bit, 0 offset	

Firmware 9.5
Inputs 6x voltage, 1x resistance

CAN-bus 250 kbps

<i>Message 1</i>		CANI_1	same as firmware 7.7		
<i>Message 2</i>		CANI_2	same as firmware 7.7		
<i>Message 3</i>	<i>Direction</i>		<i>Identifier</i>	<i>Period</i>	<i>Lengt</i>

CANI_3	Tx	18 05 27 F8	250 ms	8
<i>Start</i>	<i>Range</i>	<i>Quantity</i>	<i>Coding</i>	

three variants of the data field are periodically changed; the value of the first byte identifies the variant

B1	1 byte	Variant = 1 %chosen DTC+
B2	1 byte	SA of ECU transmitting chosen DTC
B3	bits 8-1	SPN, 8 least significant bits of SPN (most significant at bit 8)
B4	bits 8-1	SPN, second byte of SPN (most significant at bit 8)
B5	bits 8-6	SPN, 3 most significant bits (most significant at bit 8)
	bits 5-1	FMI (most significant at bit 5)
B6	bit 7-1	Occurrence Count
	bit 8	SPN Conversion Method
B7	1 byte	Index of chosen DTC
B8	1 byte	Total count of DTCs in the converter memory
B1	1 byte	Variant = 2 %check lamps 1+
B2	1 byte	Check lamps of the ECU with SA= 00 _{hex} (engine)
B3	1 byte	Check lamps of the ECU with SA= 03 _{hex} (gear-box)
B4	1 byte	Check lamps of the ECU with SA= 0B _{hex} (ABS/ASR/EBS...)
B5	1 byte	Check lamps of the ECU with SA= 0F _{hex} (engine retarder)
B6	1 byte	Check lamps of the ECU with SA= 10 _{hex} (driveline retarder)
B7	1 byte	Check lamps of the ECU with SA= 2F _{hex} (ECAS)
B8	1 byte	Check lamps of the ECU with SA= 40 _{hex} (ECAS 3.axis)
B1	1 byte	Variant = 3 %check lamps 2+
B2	1 byte	Check lamps of the ECU with SA= 21 _{hex} (Body ECU)
B3	1 byte	Check lamps of the ECU with SA= 27 _{hex} (Vehicle ECU)
B4	1 byte	Check lamps of the ECU with SA= 29 _{hex} (exhaust retarder)
B5	1 byte	Check lamps of the ECU with SA= EE _{hex} (tachograph)
B6	1 byte	(not used yet)
B7	1 byte	(not used yet)
B8	1 byte	(not used yet)

Structure of %check lamps of the ECU%byte is defined according to SAE J1939/73

bits 1-2	Protect Lamp
bits 4-3	Amber Warning Lamp
bits 6-5	Red Stop Lamp
bits 8-7	Malfunction Indicator Lamp;

Available values: 0 = Lamp off 1 = Lamp on 2 = Lamp error 3 = Lamp not used

<i>Message 4</i>	<i>Direction</i>	<i>Identifier</i>	<i>Period</i>
<i>Length</i>			
VECU2CANI	Rx	18 05 27 F9	--
<i>Start</i>	<i>Range</i>	<i>Coding</i>	8
B8	1 byte	Switch DTC	
		0 = no action	
		1 = switch to the next DTC	
		2 = switch to the previous DTC	