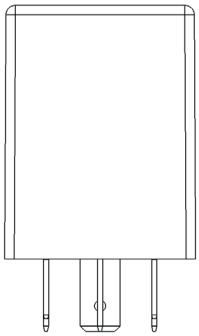
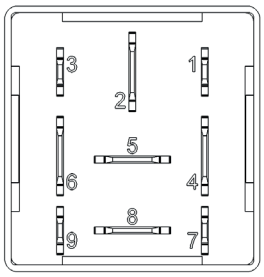


mounting direction



view of plug

DESCRIPTION

The new Micro Gateway is a compact gateway for automotive applications. The core piece, the 32-bit processor, provides you with higher performance and thus secure routing and gateway functionality at high bus loads. The 2 I/Os are now also PWM capable. Implement larger and more complex programs and applications by increasing the flash memory to 2 MB. The RAM has also been increased from 12 KB to 256 KB.

TECHNICAL DATA

Housing	Plastic PA 66GF30
Connector	Base plate 9-pin
Weight	30 g
Temperature range (ISO 16750-4 compliant)	-40 °C to +85 °C
Environmental Protection	IP 6K8 with correct mounting direction and use of the waterproof plug-in socket
Over-current protection	1 A + Load
Total Inputs and outputs	Variant with I/O: 2 Variant without I/O: 0
Inputs	**Depending on assembly options:** Analog input 0...33 V Digital input 0... 33 V
Outputs	**Configurable as:** Digital, positive switching (high side) PWM output (3 Hz…1000 Hz)
Operating voltage	9-32 V (see. p. 6) acc. to ISO 16750-2: 12 V (Code A) 24 V (Code E)
Overvoltage protection	≥ 33 V
Current consumption	70 mA
Quiescent current	80 µA @ 12 V 100 µA @ 24 V
Reverse polarity protection	Yes
CAN interface	CAN Interface 2.0 A/B, ISO 11898-2 CAN-FD-capable

SOFTWARE/PROGRAMMING

MRS APPLICS STUDIO
The Applics Studio is the new development and tool platform for our assemblies.

REGULATORY APPROVALS AND TESTING

E1 approval	ECE R10 06 9178
Elektrical tests	**Acc. to ISO 16750 – 2 resp. -4:** Short circuit protection Reverse polarity Ground offset Interruption pin and connector Long-term overvoltage at TMax -20 °C Storage test at TMax and TMin Operation test at TMax and TMin Start impulse (formerly. pulse 4 acc. to ISO 7637) Load dump for 24 V (RI=4Ω) Acc. to ISO 7637 - 2: Pulse 1, 2a, 2b, 3a, 3b, severity level III **Acc. to DIN EN 61000-4-2:2009** ESD contact discharge Housing/pins: testing severity 2 Discharge islands: testing severity 3 ESD air discharge: Housing: testing severity 3 **electricity feed-in acc. to ISO 11452-4**: 3. Ed. 2005 + updates 1 2009 to 100 mA **Freefield immunity acc. to ISO 11452-2:** 2. Ed. 2004 with 100 V/m
Mechanical tests	Acc. to ISO 16750-3: Free Fall
Chemical tests (@ Roomtempere-rature,brushing)	Acc. to ISO ISO 16750-5:2010 Battery fluid (22 h) Interior cleaner (2h) Glass cleaner (2h) Aceton (10 min) Ammonuimcontaining cleaner (22 h) Denatured alcohol (10 min) Transpiration (22 h) Cosmetic Products (Nivea Creme, 22 h) Refreshment containing coffein and sugar (Cola, 22 h) Cream, coffee whitener (22 h)

INPUT FEATURES - SUMMARY

Pin 5, 8 (optional at assembly variant with IO, see C)	Programmable as analog or digital input Resolution	 12 Bit
Voltage input 0...33 V (see A)	Input resistance Input frequency[1] Accuracy	65 kΩ f_g = 74 Hz ≤ 3 %
Digital input 0...33 V(see B)	Input resistance Input frequency[1] Turn-on threshold Turn-off threshold	65 kΩ f_g = 74 Hz 21.9 ± 0.2 V 21.7 ± 0.2 V

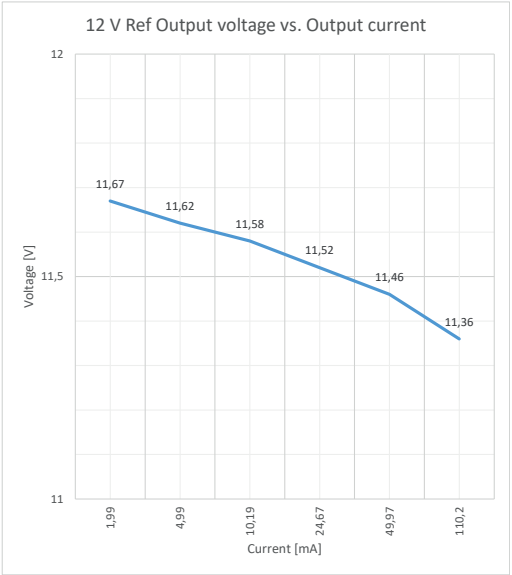
Pin 5, 8 (optional at assembly variant with analog input, see A)	Programmable as analog or digital input Resolution	 12 Bit
Voltage input 0...33 V (see A)	Input resistance Input frequency[1] Accuracy	65 kΩ f_g = 50 Hz ≤ 3 %
Digital input 0...33 V(see B)	Input resistance Input frequency[1] Turn-on threshold Turn-off threshold	65 kΩ f_g = 50 Hz 21.9 ± 0.2 V 21.7 ± 0.2 V

[1] Cutoff frequency (-3 dB)

OUTPUT FEATURES - SUMMARY

Pin 5,8 (optional)	Protective circuit for inductive loads	Integrated
	Wire fault diagnostics	Possible via current sense
	Short circuit diagnostics	Possible via current sense
Digital, positive switching (high side; see C)	Switching voltage max. switching current (permanent, T= +85 °C) Conversion factor	9-32 V DC 1 A (DO) 1 Digit ≈ 2.4 ± 0.2 mA for currents >100 mA
PWM output (high side; see C)	Switching voltage max. switching current (permanent, T= +85 °C) Conversion factor	500 mA (measured with 300 Hz, 90% DC) 1 Digit ≈ 2.4 ± 0.2 mA for currents >100 mA
Short circuit resistance against GND and U_S	Switching-off is controlled by high side driver for **each output** channel	

Pin 5, (optional)	Protective circuit for inductive loads	Not integrated
	Wire fault diagnostics	-
	Short circuit diagnostics	-
	Short circuit resistance against GND and U_S	Integrated
12 V Ref Output (see Description)	Switching voltage max. switching current (permanent, T= +85 °C)	15-32 V DC 80 mA @28 V 100 mA @ 24 V



12 V Ref output with load
(Voltage drop due to protective circuit)

PIN ASSIGNMENT POWER SUPPLY AND INTERFACES

Pin	Description
2	Contact 30 / operating voltage, activation contact 30 measure-ment via MC_DO_EN_AI_KL30
4	Contact 15 / ignition
6	Ground

Pin	Description
1	CAN1 - H
3	CAN1 - L
5	LIN0 (optional) / 12 V Ref (optional), max. output: see -ÄÄÄÄPage 2
7	CAN0 - H
8	LIN1 (optional)
9	CAN0 - L

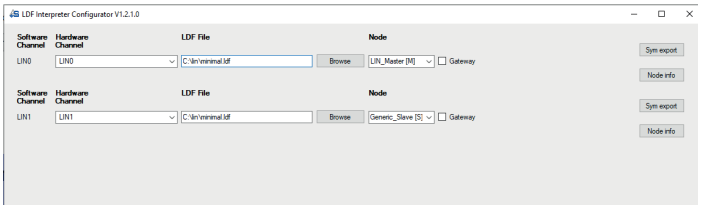
ANSCHLUSSBELEGUNG EIN- UND AUSGÄNGE

Pin	Signal	Description
5	AI_IO2 DO_HSD2_OUT PWM_HSD2_OUT LIN[3] MC_DO_12V_ DCDC_EN	Analog input 2 0-33 V or Digital output or PWM output2[2] or LIN0 (optional) or activation 12 V reference voltage (optional)

Pin	Signal	Description
8	AI_IO1 DO_HSD1_OUT PWM_HSD1_OUT LIN[3]	Analog input 1 0-33 V or Digital output or PWM output1[2] or LIN1 (optional for assembly variant)

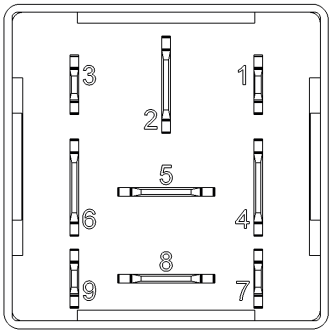
[2] initiated with f = 1 kHz and 0% DC, DC selectable in 1‰ steps (1000=100%), see Applics Studio User API
[3] Numbering can be generated dynamically (LIN0 / LIN1) via ApplicsStu-dio (LDF interpreter).

LDF-INTERPRETER IN THE APPLICS STUDIO



Software Channel
This automatically generated identifier is used to address the LIN bus in the software.
It is used as a prefix for the data points, "schedule tables" etc. generated from the LDF (e.g. LIN0_DP_COMM_ERROR, LIN0_ST_MAIN). The designation of the "LIN module" in the C code is formed by LIN_BUS_0 or LIN_BUS_1.

Hardware Channel
One of the available hardware channels can be assigned to the software channel on the left. The hardware channel corresponds to the printed pin designation on the housing.



PIN FEATURE MAP

I/O (assembly variant)			
Pin	**Analog Input**	**PWM output**	**Digital output**
5	IO_2	PWM_HSD2_OUT	DO_HSD2_OUT
8	IO_1	PWM_HSD1_OUT	DO_HSD1_OUT

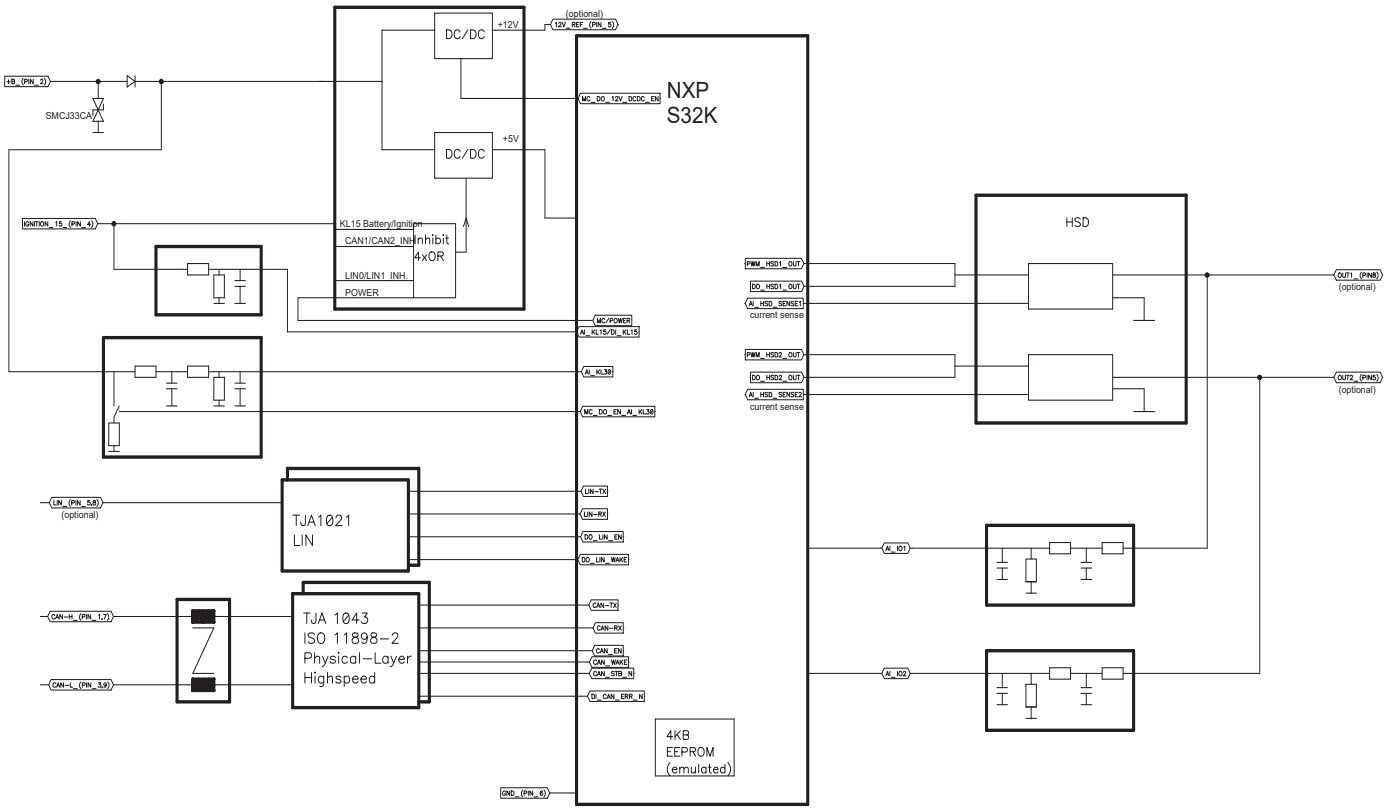
ECU

NXP S32K148
Arm ® Cortex ™ - M4F
Clock frequency:80 MHz
Flash: 2 MB
RAM: 256 K
EEPROM: 4 K
(emulated)

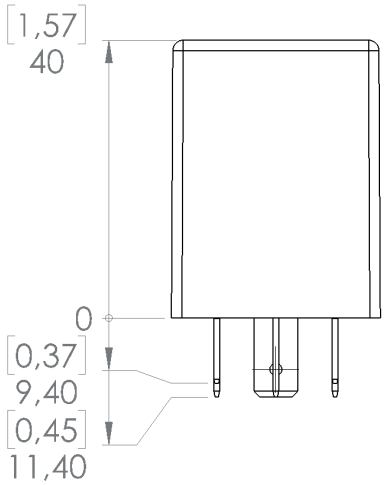
Interfaces		
Pin	**Signal**	**Description**
1	CAN1 - H	CAN Bus 1 high
3	CAN1 - L	CAN Bus 1 low
5	LIN[3] IO_2 MC_DO_12V_DCDC_EN	LIN0 (optional) I/O 2 (optional) 12 V reference (optional)
7	CAN0 - H	CAN Bus 0 high
8	LIN[3] IO_1	LIN1 (optional) I/O 1 (optional)
9	CAN0 - L	CAN Bus 0 low

Power Supply		
Pin	**Signal**	**Description**
2	AI_KL30	Supply voltage
4	AI_KL15	Ignition/ contact 15 according to DIN 72552
6		Ground / contact 31 according to DIN 72552

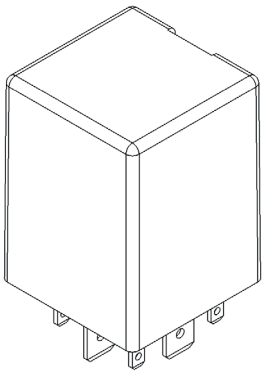
BLOCK FUNCTION DIAGRAM



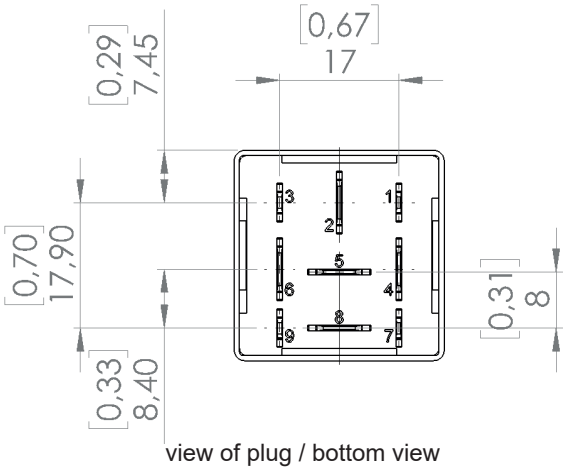
TECHNICAL DRAWING IN MM [INCH]



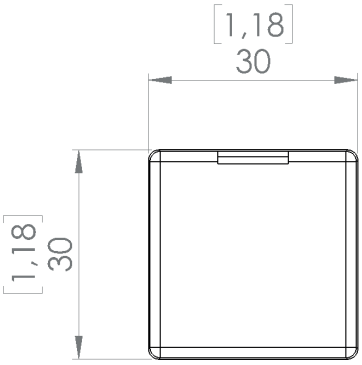
side view



angular view



view of plug / bottom view



top view

ASSEMBLY OPTIONS AND ORDER INFORMATION

	Inputs		Outputs	Wake Up source	CAN	Termi-nating resistor	LIN		LIN Potential		
	A Voltage 0 – 33 V	B Digital input	C I/O´s (can be used as analog or digital inputs or digital-/PWM output)		CAN 0/1	CAN 0/1	LIN1	LIN0	LIN1	LIN0	Description
1.156.200.2600				CAN, KL15, DO_POWER	X		X		12 V		12V Ref out, operating voltage range 15-32 V
1.156.300.0000				CAN, LIN, KL15, DO_POWER	X		X	X	KL30	KL30	operating voltage range 9-32 V
1.156.200.2000				CAN, LIN0, KL15, DO_POWER	X		X	X	12 V	KL30	operating voltage range 15-32 V
1.156.300.4000	8	8	8	CAN, LIN, KL15, DO_POWER	X			X		KL30	operating voltage range 9-32 V
1.156.300.4400	5,8	5,8	5,8	CAN, KL15, DO_POWER	X						operating voltage range 9-32 V
1.156.300.5500	5,8	5,8		CAN, KL15, DO_POWER	X						operating voltage range 9-32 V
1.156.311.0000				CAN, LIN, KL15, DO_POWER	X	120 Ω	X	X	KL30	KL30	operating voltage range 9-32 V
1.156.311.5500	5,8	5,8		CAN, KL15, DO_POWER	X	120 Ω					operating voltage range 9-32 V

ACCESSORIES

Description	Order number
Applics Studio Bundle	1.100.200.00
Connector package watertight socket 40 mm	114265
Socket	1.017.002.00
Tab receptacle for latching 2,8 mm 0,5 – 1,0 mm²	105292
Tab receptacle for latching 6,3 mm 1,0 mm²	102355
PCAN-USB interface	105358

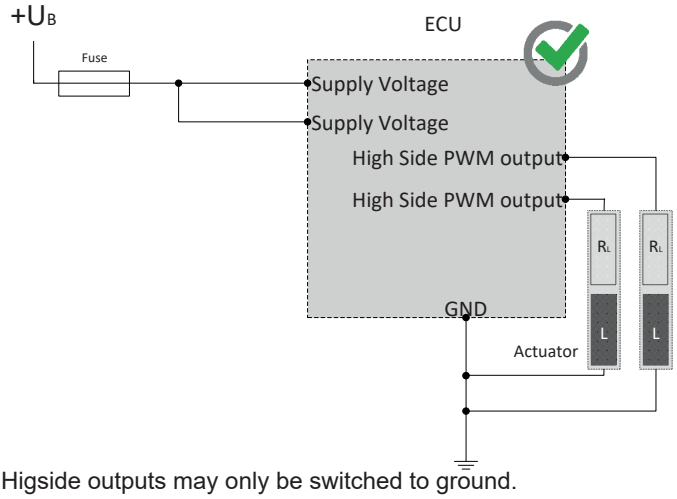
Image similar

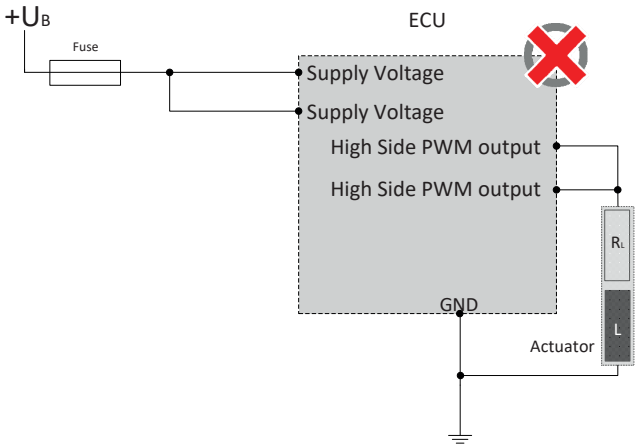
MANUFACTURER

MRS Electronic GmbH & Co. KG
Klaus-Gutsch-Str. 7
78628 Rottweil

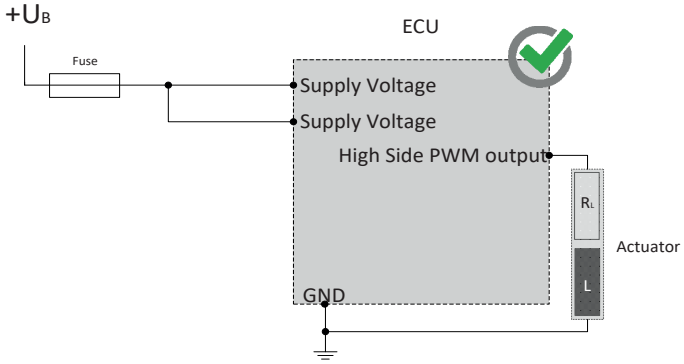
NOTES ON WIRING AND CABLE ROUTING

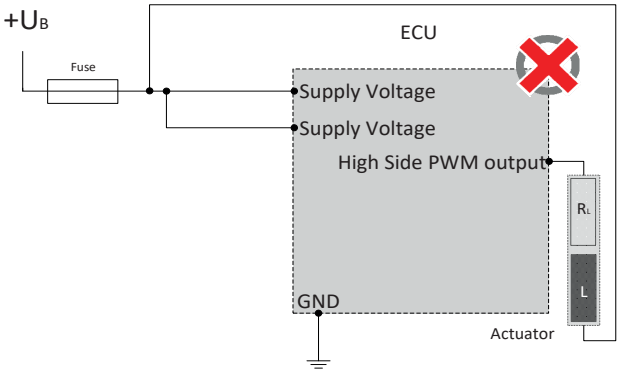
PWM outputs may not be connected with each other or bypassed.

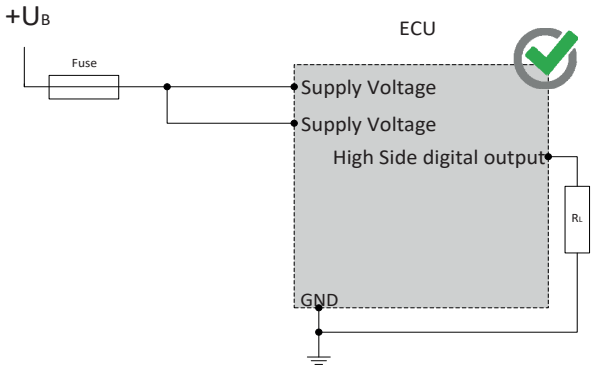


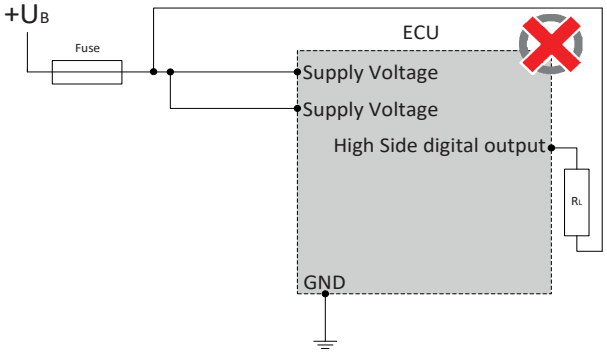


Higside outputs may only be switched to ground.

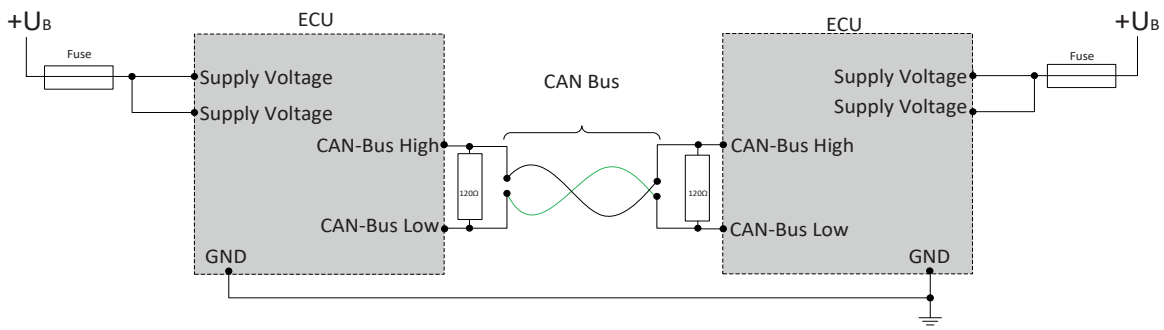








CAN / LIN bus communication is the main communication between the control unit and the vehicle. Therefore, connect the CAN / LIN bus with special care and check the correct communication with the vehicle to avoid undesired behavior.



SAFETY AND INSTALLATION INFORMATION

It is essential to read the instructions in full thoroughly before working with the device.

Please note and comply with the instructions in the operating instructions and the information in the device data sheet, see www.mrs-electronic.com

Staff qualification: Only staff with the appropriate qualifications may work on this device or in its proximity.

SAFETY

WARNING! Danger as a result of a malfunction of the entire system.
Unforeseen reactions or malfunctions of the entire system may jeopardise the safety of people or the machine.

- Ensure that the device is equipped with the correct software and that the wiring and settings on the hardware are appropriate.

WARNING! Danger as a result of unprotected moving components.
Unforeseen dangers may occur from the entire system when putting the device into operation and maintaining it.

- Switch the entire system off before carrying out any work and prevent it from unintentionally switching back on.
- Before putting the device into operation, ensure that the entire system and parts of the system are safe.
- The device should never be connected or separated under load or voltage.

CAUTION! Risk of burns from the housing.
The temperature of the device housing may be elevated.

- Do not touch the housing and let all system components cool before working on the system.

PROPER USE

The device is used to control or switch one or more electrical systems or sub-systems in motor vehicles and machines and may only be used for this purpose. The device may only be used in an industrial setting.

WARNING!Danger caused by incorrect use.
The device is only intended for use in motor vehicles and machines.

- Use in safety-related system parts for personal protection is not permitted.
- Do not use the device in areas where there is a risk of explosion.

Correct use:

- operating the device within the operating areas specified and approved in the associated data sheet.
- strict compliance with these instructions and no other actions which may jeopardise the safety of individuals or the functionality of the device.

Obligations of the manufacturer of entire systems

It is necessary to ensure that only functional devices are used. If devices fail or malfunction, they must be replaced immediately.

System developments, installation and the putting into operation of electrical systems may only be carried out by trained and experienced staff who are sufficiently familiar with the handling of the components used and the entire system.

It is necessary to ensure that the wiring and programming of the device does not lead to safety-related malfunctions of the entire system in the event of a failure or a malfunction. System behaviour of this type can lead to a danger to life or high levels of material damage.

The manufacturer of the entire system is responsible for the correct connection of the entire periphery (e.g. cable cross sections, correct selection/ connection of sensors/actuators).

Opening the device, making changes to the device and carrying out repairs are all prohibited. Changes or repairs made to the cabling can lead to dangerous malfunctions. Repairs may only be carried out by MRS.

Installation

The installation location must be selected so the device is exposed to as low a mechanical and thermal load as possible. The device may not be exposed to any chemical loads.

Install the device in such a manner that the plugs point downwards. This means condensation can flow off the device. Single seals on the cables/leads must be used to ensure that no water gets into the device.

Putting into operation

The device may only be put into operation by qualified staff. This may only occur when the status of the entire system corresponds to the applicable guidelines and regulations.

FAULT CORRECTION AND MAINTENANCE

NOTE The device is maintenance-free and may not be opened.

- If the device has damage to the housing, latches, seals or flat plugs, it must be taken out of operation.

Fault correction and cleaning work may only be carried out with the power turned off. Remove the device to correct faults and to clean it.

Check the integrity of the housing and all flat plugs, connections and pins for mechanical damage, damage caused by overheating, insulation damage and corrosion. In the event of faulty switching, check the software, switches and settings.

Do not clean the device with high pressure cleaners or steam jets. Do not use aggressive solvents or abrasive substances.

