

# Deutronic CAN-Bus – Documentation

**CAN2.0A and J1939**

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## 1. Safety Note

Between the CAN bus and the device there is a galvanically separation.

In addition, always observe the corresponding device-specific installation and safety instructions as well as the relevant data sheets.

The installation and safety instructions in addition to the data sheets can be found on our web page [www.deutronic.com](http://www.deutronic.com) in the >> **DOWNLOADS** << section.

Alternatively, please contact Deutronic Elektronik GmbH or one of our worldwide service centers.

## 2. CAN Mode

The device can be operated in two different CAN modes. The desired mode is stored fixly before the delivery in the firmware.

### 2.1 CAN Standard 2.0A

- With 11 bit identifier
- A maximum of 8 data byte per identifier is transferred
- The identifier description can partially be selected according to customer's wishes and will be stored by the manufacturer in the firmware before the delivery. For this purpose, a dynamic CAN matrix is provided by the manufacturer.
- Thus, each customer can adjust the arbitration requirements to the circumstances.

## 2.2 SAE J1939

In this mode the data is communicated via the CAN bus according to the set of rules of SAE International. (→ <https://www.sae.org/standardsdev/groundvehicle/j1939a.htm>)

PGN	Parameter Group Label	SPN	SPN Name
61714	DC/DC Converter 1 Control	8560	DC/DC 1 Operational Command
61714	DC/DC Converter 1 Control	8561	DC/DC 1 Low Side Voltage Buck Setpoint
61715	DC/DC Converter 1 Operating Status	8569	DC/DC 1 Operational Status
61715	DC/DC Converter 1 Operating Status	8572	DC/DC 1 Power Limit due to High Side Current
61715	DC/DC Converter 1 Operating Status	8573	DC/DC 1 Power Limit due to Low Side Current
61715	DC/DC Converter 1 Operating Status	8574	DC/DC 1 Power Limit due to High Side Voltage Minimum
61715	DC/DC Converter 1 Operating Status	8575	DC/DC 1 Power Limit due to High Side Voltage Maximum
61715	DC/DC Converter 1 Operating Status	8576	DC/DC 1 Power Limit due to Low Side Voltage Minimum
61715	DC/DC Converter 1 Operating Status	8577	DC/DC 1 Power Limit due to Low Side Voltage Maximum
61715	DC/DC Converter 1 Operating Status	8578	DC/DC 1 Power Limit due to Converter Temperature
61716	DC/DC Converter 1 Voltage and Current	8585	DC/DC 1 Low Side Voltage
61716	DC/DC Converter 1 Voltage and Current	8586	DC/DC 1 Low Side Current
61716	DC/DC Converter 1 Voltage and Current	8587	DC/DC 1 High Side Voltage
61716	DC/DC Converter 1 Voltage and Current	8588	DC/DC 1 High Side Current
64464	DC/DC Converter 1 Configuration 1	8824	DC/DC 1 High Side Voltage Minimum Limit Setting
64464	DC/DC Converter 1 Configuration 1	8825	DC/DC 1 High Side Voltage Maximum Limit Setting
64464	DC/DC Converter 1 Configuration 1	8826	DC/DC 1 High Side Current Maximum Limit Setting
64464	DC/DC Converter 1 Configuration 1	8827	DC/DC 1 Low Side Voltage Minimum Limit Setting
64464	DC/DC Converter 1 Configuration 1	8828	DC/DC 1 Low Side Voltage Maximum Limit Setting
64464	DC/DC Converter 1 Configuration 1	8829	DC/DC 1 Low Side Current Maximum Limit Setting

64464	DC/DC Converter 1 Configuration 1	9519	DC/DC 1 Low Side Voltage Buck Default Setting
64472	DC/DC Converter 1 Temperatures	8592	DC/DC 1 Converter Temperature
64473	DC/DC Converter 1 Low Side Limits	8566	DC/DC 1 Low Side Voltage Minimum Limit Request
64473	DC/DC Converter 1 Low Side Limits	8567	DC/DC 1 Low Side Voltage Maximum Limit Request
64473	DC/DC Converter 1 Low Side Limits	8568	DC/DC 1 Low Side Current Maximum Limit Request
64474	DC/DC Converter 1 High Side Limits	8563	DC/DC 1 High Side Voltage Minimum Limit Request
64474	DC/DC Converter 1 High Side Limits	8564	DC/DC 1 High Side Voltage Maximum Limit Request
64474	DC/DC Converter 1 High Side Limits	8565	DC/DC 1 High Side Current Maximum Limit Request
65259	Component Identification	587	Model
65259	Component Identification	588	Serial Number
65259	Component Identification Request		Data[0] = 0xEB Data[1] = 0xFE

### 3. Data Transformation Format

The queried parameter of the device are output to the CAN bus in Little-Endian format (also intel-format) to the CAN-bus. Thus, the input data is also expected in this format (see chapter 7.1 Set-Parameter).

## 4. Transmission Rate (Bus-Speed)

The following transmission rates are possible:

- 125kB/s
- 250kB/s
- 500kB/s
- 1MB/s

The desired transmission rate is set fixed before the delivery.

## 5. Pin Assignment

Only the contacts

- CAN-High
- CAN-Low

are led out of the device via the corresponding plugs.

**Note:** CAN-Ground is not available via the plugs. The respective pin assignment of the plugs can be found on the device specific data sheets.

## 6. Terminating Resistor

No fixed bus terminating resistor is installed in the device. This must be integrated by the operator at a suitable point in the network itself.

For some devices, the wiring can be realized via an external cable bridge. Details can be found in the device-specific data sheets.

## 7. Parameter

### 7.1 Set-Parameter

Adjustable parameter by a control before or during the operation.

- on / off
- setpoint output voltage (Set point output voltage)
- setpoint max. output current (Set point maximum output current)
- setpoint max. input current (Set point input current)
- setpoint min. input voltage (Set point lower input current)

If no changed set parameters are transferred before the start of the device, default-parameter will be used (see below).

### 7.2 Get-Parameter

#### 7.2.1 Single Query

The following query parameter can be send to the device by a controller to retrieve a specific current operation value once per query.

By standard, one parameter per identifier is retrieved according to the CAN basic regulation.

However, to make better use of the 8-byte data frame of an identifier, it is also possible to combine several (usually two) values under one ID according to customer specifications. This value bundling is coordinated according to customer specifications before delivery.

- on / off
- setpoint output voltage (Set point output voltage)
- setpoint max. output current (Set point maximum output value)
- setpoint max. input current (Set point input current)
- setpoint min. input voltage (Set point lower input voltage)
- actual device temperature (Actual value device temperature)
- actual input voltage (Actual value input voltage)
- serial number (Serial number)
- device name (device name)
- setpoint max. input current (Set point max. input current)
- actual input current (Actual value input current)
- setpoint min. input voltage (Set point input voltage)
- ERR

## 7.2.2 Cyclic time controlled Query

The following values can also be sent in repeating, cyclic time intervals from the device. These time intervals can be different for each parameter and are freely definable by the customer and are permanently stored in the firmware by the manufacturer before delivery.

- on / off
- setpoint output voltage (Set point output voltage)
- setpoint max. output current (Set point maximum output current)
- setpoint max. input current (Set point input current)
- setpoint min. input voltage (Set point lower input voltage)
- actual device temperature (Actual value device temperature)
- actual input voltage (Actual value input voltage)
- setpoint max. input current (Set point max. input current)
- actual input current (Actual value input current)
- setpoint min. input voltage (Set point min. input voltage)
- ERR

The cyclic query is connectible / disengageable by a separate CAN-ID.  
Otherwise, the requirements and possibilities of the **single query**, described above, are valid.

## 7.2.3 Answer

Triggered by the single query or the cyclic time routine, the following parameter values are output accordingly as a response to the CAN bus.

- on / off
- setpoint output voltage (Set point output voltage)
- setpoint max. output current (Set point maximum output current)
- setpoint max. input current (Set point input current)
- setpoint min. input voltage (Set point lower input voltage)
- actual device temperature (Actual value device temperature)
- actual input voltage (Actual value input current)
- serial number (Serial number)
- device name (Device name)
- setpoint max. input current (Set point max. input current)
- actual input current (Actual value nput current)
- setpoint min. input voltage (Set point min. input voltage)
- ERR



## 8. Default-Parameter

The following default values are defined by the customer and stored permanently in the firmware before the delivery.

- BUS-Speed
- Autostart
- setpoint output voltage
- setpoint max. output current
- setpoint max. input current
- setpoint min. input voltage

During the order processing, the customer receives respective documents where the desired default values can be documented.

These default values are in use as long as the customer does not send any parameter settings to the DC/DC converter (see chapter 7.1 Set-Parameter).

## 9. Error and Warning Message

If there is an error message (Error), the device is **directly switched off** and the user is informed about the cause by an error message.

If there is a warning message (Warning), the device is **not switched off**. The user receives a message and can take action.

### 9.1 Error-Informationen

CAN-Standard 2.0A			CAN J1939	
Byte	Bit	Label	SPN	Error message
0	0	0=No 1=Yes	not available	Output polarity reversed
0	1	0=No 1=Yes	not available	Internal supply error
0	2	0=No 1=Yes	not available	Temperature > Limit value according to data sheet
0	3	0=No 1=Yes	not available	Temperature sensor down
0	4	0=No 1=Yes	SPN8574	Input voltage > Limit value according to data sheet

### 9.2 Warning-Informationen

CAN-Standard 2.0A			CAN J1939	
Byte	Bit	Label	SPN	Warning message
1	0	0=No 1=Yes	SPN8573	Output current = Limit value according to parameterization (I_Out-Constant-Operation)
1	1	0=No 1=Yes	SPN8578	Temperature > Limit value according to data sheet (Derating)
1	2	0=No 1=Yes	SPN8572	Input current = Limit value according to parameterization (I_In-Constant-Operation)
1	5[*]	0=No 1=Yes	SPN8575	Input voltage > Limit value according to parameterization
1	6[*]	0=No 1=Yes	SPN8576	Output voltage < Limit value according to parameterization
1	7[*]	0=No 1=Yes	SPN8577	Output voltage > Limit value according to parameterization

[\*] only available for mode J1939 and customer specific CAN-Standard

## 10. Behavior in Case of Connection Interruption

There is no monitoring of the connection to the CAN bus on the part of the device.

The monitoring of the connection to the device must be ensured by the operator.

It is recommended to query the parameter in certain time intervals. Failure to respond several times in a row should be handled accordingly on the control side.

The device always continues to run with the last transmitted setting parameters. Upper and lower parameter limits are not left.

**Note:** When the device is restarted, e.g. due to a brief failure of the supply voltage, the default values are loaded. The controller must transmit the desired setting parameters again.

## 11. Notes

## 12. Service Center / Repairs

### Please note the following:

- Do not open the device!
- All of the connections and adjusting elements required for operation are accessible from the outside.

In order to ensure a swift and seamless processing, it is necessary to enclose a completed repair return form (*Return Service form*) for each returned device which includes all relevant, detailed data (e.g. address, contact name, telephone number, etc.) as well as a detailed description of the error.

You can find the required repair return form as well as the worldwide service partner addresses on our web page [www.deutronic.com](http://www.deutronic.com) in the >> **SERVICE & SUPPORT** << section.

## 13. Warranty Disclaimer

The customer is responsible for the correct use of the device. Deutronic cannot assume any liability for damages of any kind caused by use of the device.

## 14. Contact details

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