

Application Note | DC160W / DC161W

# DC160W / DC161W

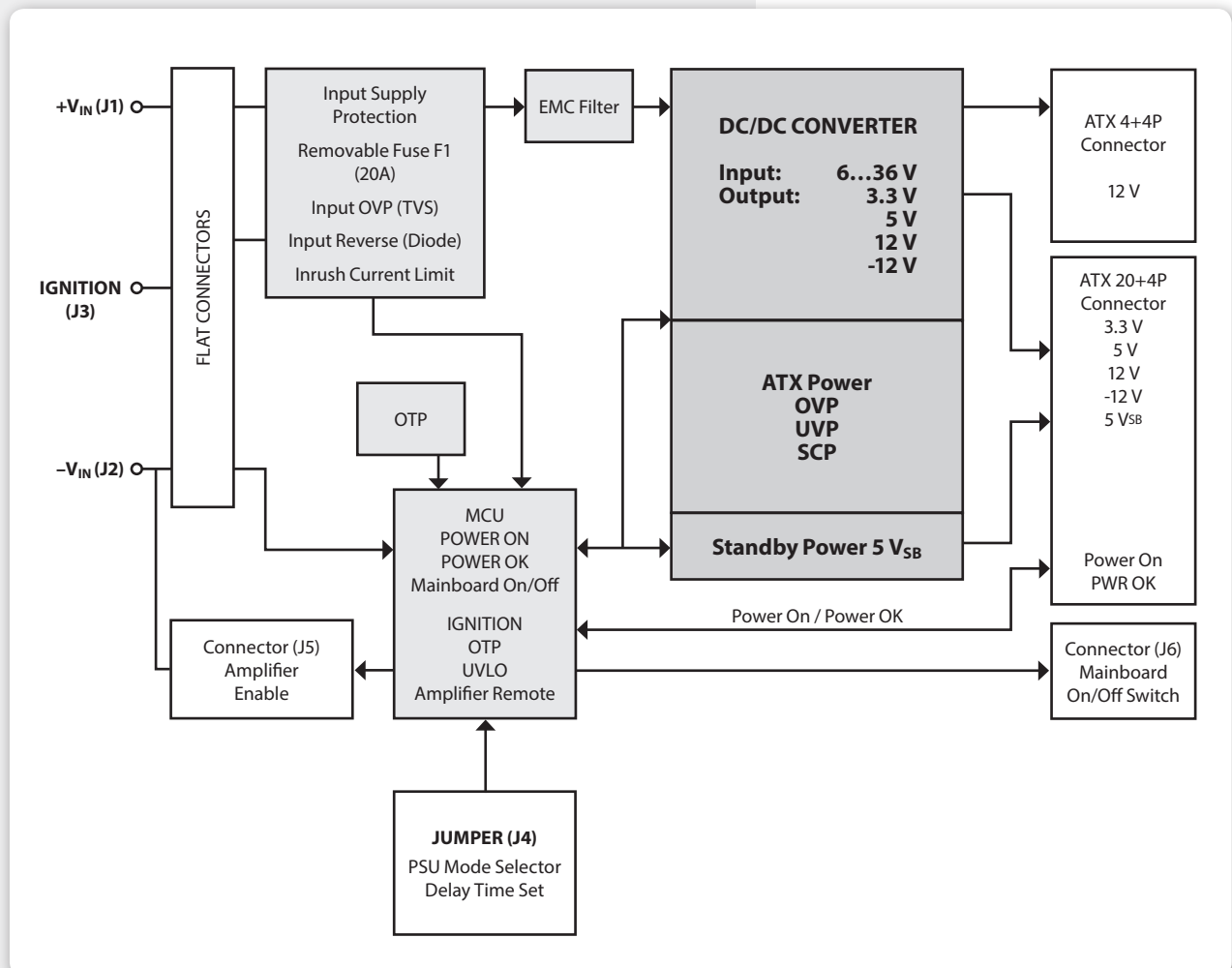
## ATX DC/DC Converter

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### 1. Introduction

The DC160W / DC161W can be used as an ATX DC/DC converter, as well as a vehicle ATX power supply for CarPCs. Please read the data sheet carefully before operating. The datasheet can be downloaded at [www.bicker.de](http://www.bicker.de)

### 2. Functional diagram



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### 3. Connection Overview

#### Input connector

- J1 Battery +** (steady plus, positive)
- J3 Ignition** (ignition plus, positive)  
For test purposes connect to battery steady plus.
- J2 Battery -** (ground, negative)

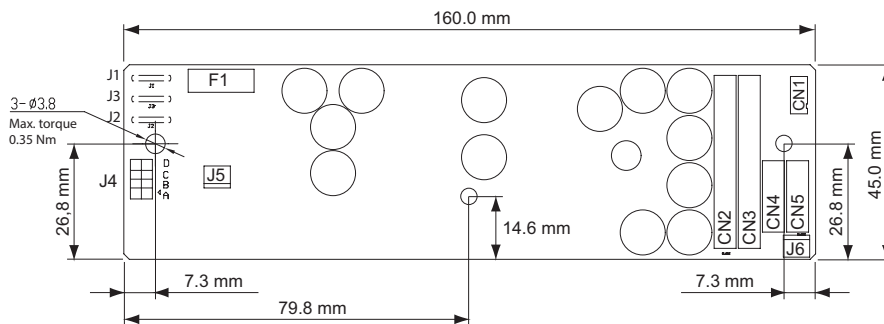
#### Jumper block, Amplifier remote On/Off and Mainboard On/Off

- J4 Jumper block** for vehicle operation modes (jumper included).
- J5 Remote On/Off for car amplifier**  
If the PC is connected to the car audio amplifier, an audible feedback can appear when the mainboard is turned on. Connecting J5 to the amplifier remote control connectors will avoid this audible feedback. The connection cable (PSZ-1020) is optionally available.

#### J6 Mainboard On/Off

If J6 (normally open NO function of DC160W / DC161W) is connected to the mainboard power On/Off, the mainboard powers up as soon as power is applied to the DC160W / DC161W (ignition of the car enabled). The connection cable (PSZ-1020) is optionally available. An external mainboard power On/Off switch can also be connected in parallel.

#### DC160W

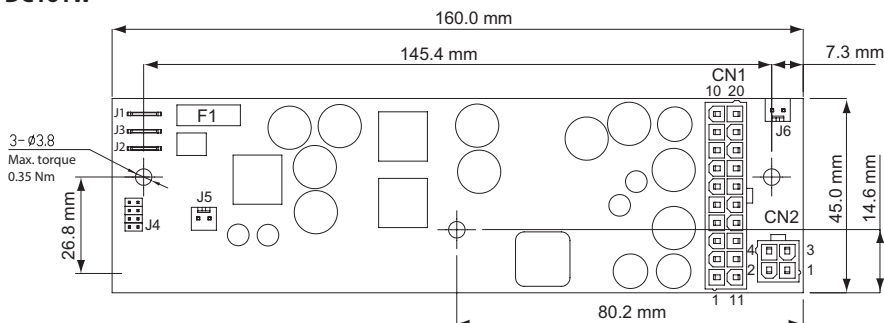


**Output connector (incl. cable harness, firmly connected to unit)**

**CN1, CN2, CN3**  
ATX, SATA, HD,  
FD power connections

**CN4, CN5**  
P4/EPS power connection

#### DC161W



**Output connector**

**CN1**  
ATX, SATA, HD,  
FD power connections

**CN2**  
P4/EPS power connection

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## 4. Operation modes

### 4.1 Power supply operation mode (Jumper block J4: no jumper)

The PSU operates as an ATX DC/DC power supply.

### 4.2 Vehicle operation mode (Jumper block J4: At least one jumper set)

To switch the mainboard on or off in the vehicle operation mode of the DC160W / DC161W, the mainboard On/Off cable (PSZ-1020) is optionally available.

↻ The following modes for ignition functions are selectable by jumper:

J4 Jumper attached=On						
A	B	C	D	Mode	Off-delay at all rails on	5V <sub>SB</sub> Hard-off
Off	Off	Off	Off	P0	PSU mode	
On	Off	Off	Off	P1	5 sec + 1 min auto-latch	1 min
Off	On	Off	Off	P2	5 sec + 1 min auto-latch	2 h
On	On	Off	Off	P3	5 sec + 1 min auto-latch	Never
Off	Off	On	Off	P4	30 sec + 1 min auto-latch	2 h
On	Off	On	Off	P5	30 sec + 1 min auto-latch	Never
Off	On	On	Off	P6	30 min	Never
On	On	On	Off	P7	3 h	Never
Off	Off	Off	On	P8	10 min	1 h
On	Off	Off	On	P9	15 min	2 h
Off	On	Off	On	P10	1 h	75 min
On	On	Off	On	P11	5 sec + 1 min auto-latch	1 min
Off	Off	On	On	P12	5 sec + 1 min auto-latch	10 min
On	Off	On	On	P13	5 sec + 1 min auto-latch	1 min
Off	On	On	On	P14	5 sec + 1 min auto-latch	10 min

⚡ **5 V<sub>SB</sub> Hard-off:** In case battery voltage falls below the listed „Switch Off“ voltage for 1 minute or longer, the DC 161 W automatically shuts down (deep discharge protection):

**Mode P1-P10**  
Switch Off @ 11.0V – Start @ 12.0V

**Mode P11-P12**  
Switch Off @ 10.5V – Start @ 10.8V

**Mode P13-P14**  
Switch Off @ 10.7V – Start @ 11.3V

**Switch Off@:** Separation of the application from 5V<sub>SB</sub> during the Hard-off time when the voltage drops below the specified value for 1 minute or longer.

**Start @:** Required voltage to (re-)start system.

⚡ **AutoLatch:** With this function the PC's power is not disconnected within the first 60 seconds to guarantee a secure start and shutdown of the PC, e.g. during a very short ignition.

**J1** input +  
Flat plug 6.3 x 0.8 mm or equal

**J3** Ignition/Start (not in mode P0)  
Flat plug 6.3 x 0.8 mm or equal

**J2** input –  
Flat plug 6.3 x 0.8 mm or equal

**J4** Jumper block (incl. Jumper)

**J5** Remote ON/OFF  
for motor vehicle amplifier  
JS-6001-02 2P or equal

**J6** Mainboard ON/OFF  
JS-6001-02 2P or equal

**F1** Fuse 20 A

### Switch-off delay

After the defined time, the mainboard will be shut down via the connection J6↔mainboard.

### Deep discharge protection 5 V<sub>SB</sub>-OFF:

**P1-P10:** When battery voltage falls below 11 V for 1 minute or longer the DC160W / DC161W automatically shuts down and will be reactivated when battery voltage is >12V.

**P11-P12:** When battery voltage falls below 10.5V for 1 minute or longer the DC160W / DC161W automatically shuts down and will be reactivated when battery voltage is >10.8V.

**P13-P14:** When battery voltage falls below 10.7V for 1 minute or longer the DC160W / DC161W automatically shuts down and will be reactivated when battery voltage is >11.3V.

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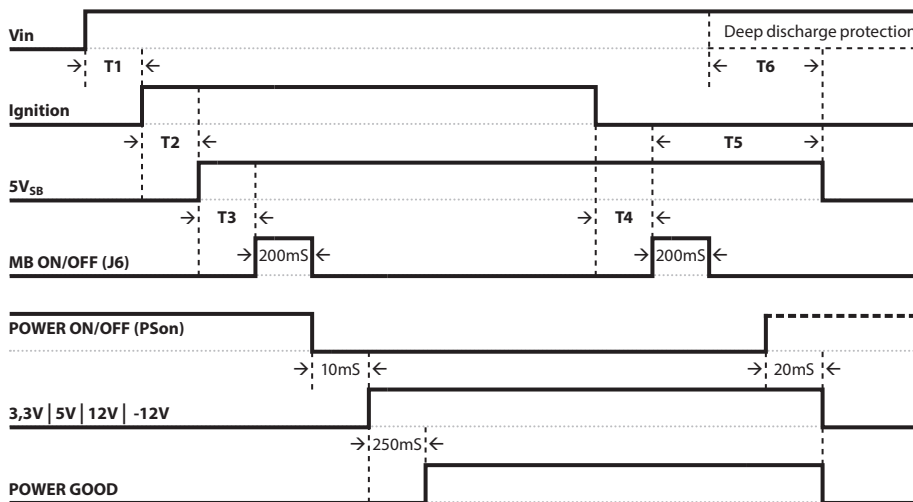
### Auto-Latch

With this function the PC's power is not disconnected within the first ~65 seconds for modes P1-P3 and P11-P14 and the first ~90 seconds for modes P4-P5, respectively. In this way a secure start and shutdown of the PC is guaranteed, e.g. during a very short ignition.

### Operation in vehicle mode

The DC160W / DC161W sends an „ON“ signal via connector J6 to the mainboard as soon as voltage is applied to the DC160W / DC161W. The CarPC is started automatically. If you do not want your PC to start automatically, do not connect J6 to the mainboard On/Off connector.

### TIMING DIAGRAM



The following modes are selectable by jumper J4 (Jumper attached=On)

Mode	T1	T2	T3	T4 MB ON/OFF OFF-DELAY	T5 5Vsb HARD-OFF	T6 DEEP DISCHARGE PROTECTION
P1	1 sec	5 sec	1 sec	5 sec + 1 min auto-latch	1 min	1 min
P2	1 sec	5 sec	1 sec	5 sec + 1 min auto-latch	2 hour	1 min
P3	1 sec	5 sec	1 sec	5 sec + 1 min auto-latch	Never	1 min
P4	1 sec	5 sec	1 sec	30 sec + 1 min auto-latch	2 hour	1 min
P5	1 sec	5 sec	1 sec	30 sec + 1 min auto-latch	Never	1 min
P6	1 sec	5 sec	1 sec	30 min	Never	1 min
P7	1 sec	5 sec	1 sec	3 hour	Never	1 min
P8	1 sec	5 sec	1 sec	10 min	1 hour	1 min
P9	1 sec	5 sec	1 sec	15 min	2 hour	1 min
P10	1 sec	5 sec	1 sec	1 hour	75 min	1 min
P11	1 sec	5 sec	1 sec	5 sec + 1 min auto-latch	1 min	1 min
P12	1 sec	5 sec	1 sec	5 sec + 1 min auto-latch	10 min	1 min
P13	1 sec	5 sec	1 sec	5 sec + 1 min auto-latch	1 min	1 min
P14	1 sec	5 sec	1 sec	5 sec + 1 min auto-latch	10 min	1 min

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#### Operation in vehicle mode (continuation)

**a) Ignition OFF.** Initial state.

**b) Ignition ON.** 1 second after ignition on the DC160W / DC161W activates the 5V<sub>SB</sub> rail. After another second an „ON“ signal is sent to the mainboard via J6. The mainboard or the PC starts and the system boots.

**c) Ignition ON while driving:** No impact. The computer will remain ON.

**d) Ignition OFF.** After a defined delay (see jumper settings chart), the DC160W / DC161W switches off the mainboard via J6. The PC shuts down. During shutdown, the mainboard is still powered.

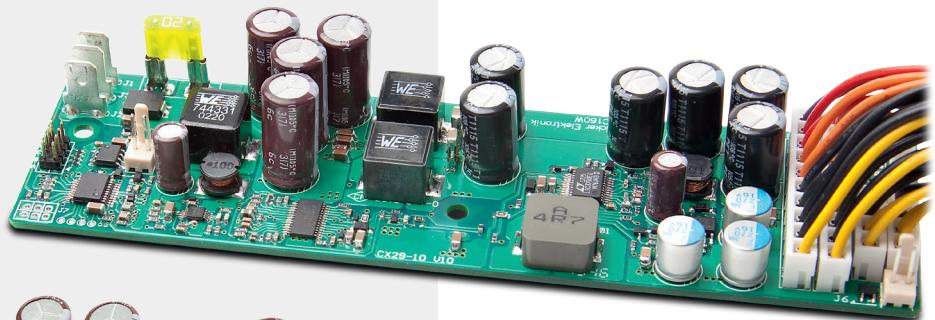
**e) Ignition OFF - 5V<sub>SB</sub> phase.** 5 V<sub>SB</sub> will be available for the defined time ( see jumper settings for „5V<sub>SB</sub>-OFF“). After this time the power is switched off, regardless of the current state of the mainboard. When parameter „5V<sub>SB</sub>-Hard-Off“ is set to „Never“ the PSU will always provide 5V<sub>SB</sub> and the PC can also be used in sleep mode.

In addition the integrated discharge protection constantly monitors the voltage of the supply source and switches the DC160W / DC161W automatically off, when battery voltage falls below values listed under point 4.

When the ignition is turned „ON“ during the 5V<sub>SB</sub> phase, the computer starts again.

**f) If the ignition is activated after a 5V<sub>SB</sub> Hard-Off** the DC160W / DC161W switches on again.

DC160W



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