This power supply is responsible for delivering non-isolated 5V power to the high voltage electronics. All AMS bus connected devices are powered from this regulator. Maximum current draw is 250mA. This switcher was selected for its high efficiency even at light load.

I²C Pullup

This flyback converter has been simulated in LTSpice.

The LT8302 requires a minimum current draw for stable voltage regulation. If this current draw is not met, the 5V rail can go as high as 20% over voltage. It is not recommended to run any digital logic or sensitive ICs from this source.

Minimum Current Draw: 10mA
Maximum Current Draw: 2.2A

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Fall Semester 2015
Lafayette College
SAFETY LOOP RELAY

This relay is responsible for switching the PACMAN safety loop connection ON/OFF. The lights show the user at a glance if the safety loop is open or closed.

This relay is capable of switching 1A in AC configuration.

SLOOP_A pins are shorted together only when the safety loop is closed
SLOOP_B pins are always shorted together

FAN CONTROL N-FET

This MOSFET is responsible for switching the charge fan ON/OFF. The fan will not come on automatically when charging begins, it is controlled by the software.

Fan Output Voltage: 5V

APPLICATION NOTE:
The 5V line is not tightly regulated in low load scenarios. All devices attached to the 5V rail should be tolerant to voltage spikes of around 20%.
NOTE: Population of R26 is optional.
R26 should only be populated if you intend to use this board as a terminating CAN node.
(R26 should usually be unpopulated.)
This diode is used to power the PACMAN computer board when the battery pack has been fully discharged. If voltage is not present between PACK+ and PACK-, then this diode will allow the USB port to supply up to 500mA of sustained current. For periods less than 0.1 seconds, 1A can be drawn.

USB UART

This is an FTDI USB Serial Converter IC. It can be used to upload code, configure the device, or transfer debugging information if the software is configured properly.

Drivers available for Windows, Mac OS & Linux

UART LEDS

These LEDs light when USB serial data is being transmitted.
**HIGH VOLTAGE**

- Battery
- Detect
- EXT DC

**GROUNDED LOW VOLTAGE**

- USBD-
- USBD+
- GND
- VUSB
- Vbus
- D- 1
- D+ 2
- GND 3
- Shield_1 4
- Shield_2 5

**USB UART**

- USB

**PACK Wiring Harness Application Note**

Port J2 is a DB-37 backplane connector, which will be connected to the pack wiring harness via solder pot connections. The wiring of this connector and its inputs/outputs are described in more detail in the pack wiring diagram.

**Safety Loop A/B**

- SLOOP_A pins are shorted together only when the safety loop is closed
- SLOOP_B pins are always shorted together

**GLV Harness**

This device only uses 3 pins from the GLV connector: CANH, CANL, and GLV_GND.

**Charge 1/2**

Charge Relay output, up to 5V & 1.5A can be used. A solid state or PCB-mount relay is recommended to keep current draw within specification.

**LCD HEADER/SWI2C**

This 4 wire connector is used to interface with an optional I2C LCD such as the DF-Robot 20x04 character display, or the Adafruit LCD Backpack. NOTE: This port is software I2C only.

**AVR Debugging**

JTAG Programming/Debug Header

- TCK 1
- TMS 5
- TDI 4
- TDO 3
- GND 2

- +3.3V
- +5V

**Title:** Battery Pack Management Computer

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*Fall Semester 2015*  
*Sheet: /External Connectors/  
*File: connectors.sch*