Before you start...

Please take a moment and read this manual before you install the M4-ATX in your vehicle. Often times, rushing into installing the unit can result in serious damage to your M4-ATX board, computer and probably your car’s electrical system. **Always double check the polarity** of your wires with a voltmeter.

Avoid using the cigarette plug as a power source, often times the contacts are not capable of delivering high current to your PC.

Introduction

Thank you for purchasing the M4-ATX power sequencer / vehicle ATX power supply.

The M4-ATX was designed to work with a wide variety of main boards ranging from low power to fully fledged Intel, AMD or VIA motherboards.

**M4-ATX Logic Diagram**
Power Input Connectors (bottom, right)

Left  Battery negative (GND)
Center Ignition (To start connect to Battery +). Do not use in the standard PSU mode (mode P0)

Right  Battery positive (+)

(A) ATX Power Output Connector 20/24 pin connector
(B) 12V-ATX power output connector 4 pin
(C) Configuration dip switches

(J5) For internal use only (do not use)
(J6) Amplifier THUMP wire harness (connects to the M4-ATX pin header)
(J3) Fan Header. Positive pin is closest to "J3" marking.
(J8) USB, Motherboard ON/OFF and THUMP (Thump also available on J6)

1) GND  6) To Motherboard ON/OFF
2) GND  7) To motherboard ON/OFF
3) USB D+  8) Amplifier Thump
4) USB D-  9) GND
5) Vcc  19 N/C (key)

1 2 3 4 5

N/C  9 8 7 6

J8 shown with cable harness connected to the motherboard ON-OFF header (pin 7 and 6)
IMPORTANT: Always use the "Hibernate" feature, never use "Standby" as it can severely discharge your battery over extended periods of time. NEVER use “hard-off = NEVER” settings unless you understand the risks of battery depletion. Even with safety limits in place, your battery might be not be able to start your engine. “Hard-off=NEVER keeps your 5VSB rail on at all times”

*AutoLatch is active during the first 60s of PC operation (and only during the first 60 seconds). For example, If Ignition is turned ON and then OFF right away, M4-ATX will latch Ignition in ON position for the next 60 seconds, allowing your operating system to fully come up. This will prevent disk drive corruption or systems that remain hung in the ON position. After the first 60 seconds of system operation, the AutoLatch feature will be removed and system will shut down at as governed by the “Off-delay” setting.

P0: In this mode, the M4-ATX behaves like a regular ATX power supply. If J6 is connected to the motherboard, M4-ATX will also send a gratuitous “ON pulse” to the motherboard right after power is first applied.

P1 (recommended): Sends ON pulse to motherboard when ignition is ON for more than 5 seconds, sends OFF pulse to motherboard 5 seconds after ignition is turned off. Waits another 60 seconds and then shuts down 5VSB to conserve battery. In this mode, the M4-ATX consumes less than 0.5mA. This is our recommended setting.

NOTE: Should you need to reset to factory defaults (in case changes were made via the USB uplink), simply power off the unit, connect a jumper to JP1 and then apply power back up for more than 2 seconds. The LED light will start to flash rapidly indicating that the factory defaults were loaded. Don’t forget to Remove jumper! Disconnect M4-ATX from battery for at least few seconds. You are done!

Power challenges in a vehicle PC: One of most difficult tasks of operating a PC in a vehicle is power consumption while the computer is OFF. Even when your computer is OFF or in Suspend, it will still consume about 50-150mA on the 5VSB rail. No matter how big your battery is, you will eventually drain it if proper actions are not taken.

The M4-ATX is addressing these issues by cutting off the 5VSB rail after a pre-defined amount of time (see jumper chart, HARDOFF). During HARDOFF if the battery level drops below 11.2V for more than one minute, M4-ATX will shut down and re-activate only when the input voltage is above 12V.

Engine Cranks, under-voltage and over-voltage situations. Another difficult task is maintaining stable power to your PC. While car batteries are rated at 12V, they actually provide voltages in between 8-16V (engine cranks) or as high as 80 volts (load dump). Most times, your battery will stay at 13.5V but extra precautions need to take place in
order to prevent such situations. M4-ATX operates as low as 6V and as high as 30V while providing strict regulation as well as input voltage clamping and reverse protection.

Anti-Thump: If your PC is connected to your car amplifier, you will hear a loud pop when the computer is first started. The M4-ATX has an ‘anti-thump’ control that will keep your amp OFF while the PC starts. Simply connect the 2 pin wire to J6 harness to your amplifier remote control pins. The pin at the edge of the PCB is GND, inner pin is HOT.

**Mode of operation explained**

1) Ignition=OFF. Nothing happens. M4-ATX is waiting for ignition signals.

2) Ignition=ON. M4-ATX waits for few seconds then turns on the 5VSB rail. After another second M4-ATX sends an “ON” signal to the motherboard via the 2 wires connected to the motherboard’s ON/OFF pins. The motherboard will turn ON and your system should start booting. The ignition state will be latched for 60 more seconds so that the motherboard will have a chance to come up in a clean manner.

3) Ignition=ON. Your computer will remain ON.

4) Ignition=OFF. M4-ATX waits for “OFFDELAY” in seconds (see jumper chart) and then it turns the motherboard OFF by sending a signal to the motherboard’s ON/OFF switch. Your computer should turn off gracefully (shutdown procedure). After shutdown, 5VSB will still be provided for another “HARDOFF” seconds. During the HARDOFF procedure, the battery levels will be constantly monitored to prevent deep discharge situations.

5) M4-ATX will go to step 1, if ignition is tuned ON again.

**NOTE**. When all dip switches are off, M4-ATX acts as a regular power supply. M4-ATX will also send a gratuitous “ON” pulse (to the ON/OFF motherboard pins, should you have a wire harness connected to it) when power is applied for the first time. Do not connect the on/off switch if you don’t want your PC to be started automatically.

**M4-ATX Characteristics**

- Minimum Input Operating voltage: 6V
- Maximum Input Operating voltage: 30V (hard clamping will occur at 34V)
- Deep-Discharge shutdown threshold: 11.2V
- Input current limit (fuse protected): Mini-blade 25A
- Max Output Power: 250 Watts / 300 watts peak
- Deep Sleep Current Consumption: < 1.6mA
- Storage and operating temperature: -40 to +125 degrees Celsius (storage), -40 – 65C (operating)
- MTBF: 200,000 Hrs
- Efficiency (Input 10-16V): >95%, all rails combined, 50% load.
- Input connectors: M4 screw terminal
- Output Connector: ATX Power 24 pin (Molex P/N 39-01-2200)

*Unit shuts down when internal temperature sensor indicates > 85C. This value can be changed with software.

**Maximum Power Characteristics**

<table>
<thead>
<tr>
<th>Output Rail</th>
<th>Current (Max)</th>
<th>Current Peak (&lt;30 seconds)</th>
<th>Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5V</td>
<td>15A</td>
<td>20A</td>
<td>1.5%</td>
</tr>
<tr>
<td>3.3V</td>
<td>15A</td>
<td>20A</td>
<td>1.5%</td>
</tr>
<tr>
<td>5VSB</td>
<td>1.5A</td>
<td>2A</td>
<td>1.5%</td>
</tr>
<tr>
<td>-12V</td>
<td>0.15A</td>
<td>0.2A</td>
<td>10%</td>
</tr>
<tr>
<td>12V</td>
<td>12A (see below)</td>
<td>16A (see below)</td>
<td>2%</td>
</tr>
</tbody>
</table>

When operating at <8V or >28V or extreme temperatures, de-rate by 25-50%, ventilation might be required. When operating at constant 160watts or more forced ventilation might be required.

**12V Rail Output Current (12V buck/boost converter)**

<table>
<thead>
<tr>
<th>Input (V)</th>
<th>12V out current</th>
<th>Input (V)</th>
<th>12V out current</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-8V</td>
<td>8A</td>
<td>11-16V</td>
<td>12A (16A peak)</td>
</tr>
<tr>
<td>8-11V</td>
<td>10A (12A peak)</td>
<td>16-30V</td>
<td>12A (14A peak)</td>
</tr>
</tbody>
</table>

**Support and warranty**: Standard Hardware Warranty 1Year / US, 2 Year EU.