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M3-ATX

6-24V Intelligent ATX Power Supply

Installation Guide

Version 1.0c
P/N M3-ATX-01

Before you start…

Please take a moment and read this manual before you install the M3-ATX in your
vehicle. Often times, rushing into installing the unit can result in serious damage to your M3-ATX board, computer and probably your car's electrical system. **Always double check the polarity** of your wires with a voltmeter.

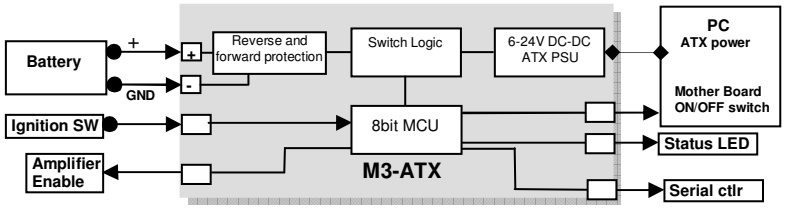
Avoid using the cigarette plug as a power source, often times the contacts are not capable of delivering high current to your PC.

Introduction

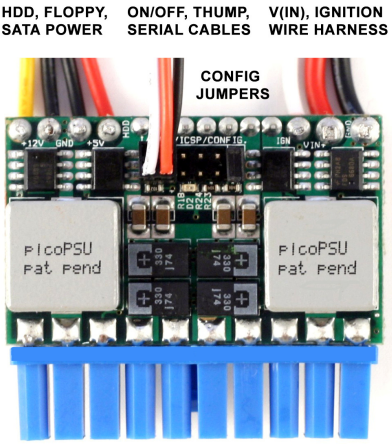
Thank you for purchasing the M3-ATX power sequencer / vehicle ATX power supply.

The M3-ATX was designed to work with a wide variety of main boards such as the VIA mini-ITX motherboards as well as Pentium-M / Celeron or full power Pentium systems.

M3-ATX Logic Diagram



1.2 M3-ATX Connection diagram



Power Input Connectors (right side)

Red **Battery +** (positeive, un-switched battery)
Black **Battery -** (negative)
White **Ignition** (To start connect to Battery +).Do not use in the standard PSU mode (mode P0)

Power Output Connectors (left side)

Hard drive wire harness (HDD, SATA-HDD, Floppy)

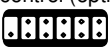
ON/OFF and THUMP wire harness (connects to M3-ATX pin header)

-ON/OFF wire harness (red/back) to connect to motherboard's ON/OFF pin headers.
-THUMP (white) to connect to amplifier remote ON/OFF connector.

P	Off-delay	Hard-off
P0	Standard PSU mode	
P1	5sec	1 min
P2	1 min	5 min
P3	30 min	2 hour
P4	custom	custom



Wire harness for motherboard ON/OFF switch and Thump control (optional



Wire harness for serial connection.

IMPORTANT: Always use the "Hibernate" feature on your PC, never use "Standby".

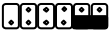
P0: In this mode, the M3-ATX behaves like a regular ATX power supply.

P1: Sends ON pulse to motherboard when ignition is ON for more than 2 seconds, sends OFF pulse to motherboard **5 seconds** after ignition is turned off. Waits another **1 minute** and then shuts down 5VSB to conserve battery. In this mode, the M3-ATX consumes less than 0.5mA. **This is our recommended setting.**

P2: Sends ON pulse to motherboard when ignition is ON for more than 2 seconds, sends OFF pulse to motherboard **60 seconds** after ignition is turned off. Waits another **5 minutes** and then shuts down 5VSB to conserve battery.

P3: Sends ON pulse to motherboard when ignition is ON for more than 2 seconds, sends OFF pulse to motherboard **30 minutes** after ignition is turned off. Waits another **2 hours** and then shuts down 5VSB to conserve battery.

P4: Can be set to any value. Setting can be done via an optional serial cable. (Default values for P4 are Off-delay=30sec, Hard-off=30sec)

NOTE: To reset to the M3-ATX settings to the factory defaults (in case changes were made via the serial uplink), simply power off the unit, connect a jumper as shown and then power back up. The LED light will start to flash rapidly indicating that the factory defaults were loaded.  **Don't forget to Remove jumper when 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, it will still consume about 100mA on the 5V rail. When the computer is in the suspend mode, it will consume even more power, because the RAM needs to be powered at all times. *No matter how big your battery is, you will eventually drain it if proper actions are not taken.*

The M3-ATX is addressing these issues by cutting off the 5VSB rail after a pre-defined amount of time (see jumper chart, HARDOFF). During the HARDOFF if the battery level drops below 11.2V for more than one minute, M3-ATX will shut down and re-activate only when the input voltage is > 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 7-11V (engine cranks) or as high as 80 volts (load dump). Most of the times, your battery will stay at 13.5V (while car is running) but extra precautions need to take place in order to prevent such situations. M3-ATX can operate as low as 6V and as high as 24V while providing strict regulation on all rails along with input voltage clamping and reverse protection.

Loud amplifier pops when PC starts. If your PC is connected to your car amplifier, you will hear a loud pop when the computer is first started. The M3-ATX has an 'anti-thump' control that will keep your amp OFF while the PC starts. Simply connect the white wire from your M3-ATX cable harness to your amplifier remote control pin.

Mode of operation

1) Ignition=OFF. Nothing happens. M3-ATX is waiting for ignition signals.

2) Ignition=ON. M3-ATX waits for 2-3 seconds then turns on the 5Vsb rail. After another second M3-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.

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

4) Ignition=OFF. M3-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. In the event where the shutdown process is longer than "HARDOFF" (Operating System gets frozen, etc), power will be shut down hard, turning off all power rails. During the HARDOFF procedure, the battery levels will be constantly monitored to prevent deep discharge situations.

5) M3-ATX will go to step 1, if ignition is tuned ON again.

NOTE. When all config. jumpers are removed, M3-ATX acts as a regular power supply, no ignition timing, no HARDOFF. M3-ATX will send a gratuitous "ON" pulse to the M/B 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.

Troubleshooting

a) **Motherboard is not turning ON:** Check input cables.Make sure you have a a well tighten wire harness. Measure the un-switched pin (red). You should see 12V (car on) or 0V (car off). NOTE: In P1, P2, P3 modes if V(In) is < 12V, the M3-ATX will not start.

b**) Motherboard is not turning ON (cont)**: Ensure total system power consumption does not exceed the M3-ATX specifications.

c) Motherboard is not turning ON (cont). Make sure that the ON/OFF wire harness from the M3-ATX is connected to the ON/OFF switch of your M/B.

M3-ATX Characteristics

Minimum Input Operating. voltage	6V
Maximum input Operating voltage	24V (clamping will occur at 25-27V)
Deep-Discharge shutdown threshold	11.2V
Input current limit (fuse protected)	15A
Max Output Power	125 Watts (8-16V, see chart below)
Deep Sleep Current Consumption.	< 0.5mA
Storage and operating temperature	-55 to +125 degrees Celsius (storage), -40 – 65C (operating)
MTBF	150,000 hrs @ 50C, 96,000 hrs @65C
Efficiency (Input 9-16V)	>94%, all rails combined, 50% load.
Input connectors	Faston 0.25" terminal
Output Connector	ATX Power 20 pin (Molex P/N 39-01-2200)

*Units starts failing at >125 Celsius. Operating at temperatures above 85C / 185F will drastically reduce the MTBF.

Maximum Power Characteristics

Output Rail	Current (Max)	Current Peak (<30 seconds)	Regulation
5V	6A	8A	1.5%
3.3V	6A	8A	1.5%
5VSB	1.5A	2A	1.5%
-12V	0.15A	0.2A	10%
12V	4-6A (see below)	8A (see below)	2%

When operating at <8V or >16V or extreme temperatures, de-rate by 25-50%, ventilation will be required.

12V Rail Output Current (buck/boost converter)

Input (V)	12V out current	Input (V)	12V out current
6-8V	4A (6A peak)	11-16V	6A (8A peak)
8-11V	5A (7A peak)	16-24V	4A (7A peak)

Support and warranty: Standard Hardware Warranty 1Year / US, 2 Year EU
Installation support: 30days via email, support@mini-box.com

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