

# Ample Power Company

## EnerMatic System Controller



**EnerMatic Controller**

### Introduction to Energy Automation

The EnerMatic Controller integrates and automates all monitoring, regulation and control of small energy systems. The parameters of the main energy bank are continuously monitored, and the acquired data is used to control solar, wind, and engine driven chargers. The auxiliary engine is started when necessary, and shut off when the batteries no longer need it. The EnerMatic Controller is compatible with Ample Power bio-diesel battery chargers, rated up to 300 Amps, and may be used with AC generators driving inverter/chargers.

All control actions are automated according to user programmed parameters. Programming the EnerMatic is easily done using any personal computer, VT100 terminal or other device that can emulate a VT100. The user interface is based on menus, forms, and selections . . . the kind of interfaces used on the Internet.

The EnerMatic is rich in features, highly accurate, and operated by firmware which can be upgraded any time a new version is released . . . without removing the unit from the system. Simply download the latest version from the Internet and install it!

The EnerMatic has been designed to take the place of a myriad of other controllers, regulators, and monitors. If you presently have an energy system, or plan to own one in the future, the choice has never been simpler . . . EnerMatic.

### Automatic Energy . . . your system

The EnerMatic Controller does it all . . .

- starts/stops the auxiliary generator;
- monitors engine RPM;
- monitors engine water temperature;
- monitors engine oil pressure;
- controls engine oil exchange pump;
- monitors engine oil level;
- monitors fuel level;
- regulates auxiliary and/or main engine alternators;
- monitors battery Volts, Amps, and temperature;
- monitors alternator current;
- controls solar and wind chargers;
- optionally regulates solar panels;
- controls starter battery cross charge solenoid;
- diverts excess solar/wind energy to primary/secondary loads;
- computes Amp-hours consumed;
- computes Ah remaining using Peukert's equation;
- interfaces to your Windows/Mac/Linux computer;
- interfaces to web server;
- interfaces to a GSM phone modem;
- operates redundantly with other EnerMatics;

### Features and Benefits Galore

- fast, powerful, yet low energy microcomputer:
  - ▷ programmable in high level language;
  - ▷ enough memory to provide a *simple* user interface using VT100 terminal emulator;
  - ▷ flash based firmware for easy upgrades to newer Internet downloadable versions
  - ▷ firmware upgrade via ubiquitous *xmodem* protocol
  - ▷ two serial ports for computer plus network
- smart, temperature compensated, multi-step alternator regulation:
  - ▷ a *safe* fast, full charge;

- ▷ minimizes engine hours and fuel consumption;
- ▷ extends battery life;
- real time clock/calendar with *supercap* backup:
  - ▷ quiet times when the engine is not allowed to run;
  - ▷ event time stamping for historical analysis;
- high resolution analog circuits;
  - ▷ accurate Amp-hour computations of consumed and remaining;
- complete engine monitoring, starting and stopping:
  - ▷ shutdown on loss of oil pressure, or overheating;
  - ▷ automatic start and stop based on battery state-of-charge;
  - ▷ automatic stop if alternator/regulator fails;
  - ▷ operates remote radiator fan and/or hot water circulation pump;
  - ▷ start/stop based on voltage/time, temperature, remote contact closure or combinations of these conditions;

## Applications

- Remote Homes;
- Remote Telcom Sites;
- Recreational Vehicles;
- Pleasure and Commercial Vessels;
- Towed Barges;
- Offshore Platforms;
- Ocean Research Buoys;
- Network Systems Backup;
- Wireless interface;
- Refrigeration Systems Start/Stop;
- Orchard Freeze Prevention Blowers, Start/Stop;
- Mountain Top Radio Repeater Site;
- Portable First Response Systems;

## Web Server Option



### EnerMatic Web Server

The EnerMatic Controller has two serial ports. Both serial ports provides complete access to all data and functions of the unit.

One serial port provides a terminal interface to be used with any PC or laptop computer.

The other serial port communicates via a *Remote Access Protocol* that allows another computer to interact with the EnerMatic. The *RAP* protocol is published so that anyone can write a program to communicate with the EnerMatic.

Ample Power provides a small, very low power web server, called *Rap-Web* which communicates with the EnerMatic and formats information into web pages that represent data and control panels. A user can aggregate data and control functions into panels of their own choosing.

*Rap-Web* has an ethernet port, USB ports, and additional serial ports. It can be connected to an intranet, and routed to the world via a firewall/router.

The user can also select data items to be logged and plotted periodically for web presentation. This allows tracking parameters over time, such as battery voltage, engine RPM, or alternator Amps.

*Rap-Web* software uses javascript to build web pages and has been tested with popular browsers for compatibility.

### EnerMatic Controller . . . Ordering Information

Model # (Volts)	List Price (\$)
EMC-12	5,499
EMC-24	6,149
EIM-24	1,599
EMC-48	6,999

### Rap-Web Sever . . . Ordering Information

Item	List Price (\$)
RAP-WEB-SERVER	3,999