

## Applied Solar Technologies

Hybrid Controller with PV Solar  
Remote Monitoring  
Energy Management from NOC



## Introduction

The Hunter AST designed solar MMU device enables complete management of all Off-Grid and Grid based Solar Installations.

The unit comes integrated with complete hardware and software monitoring for Alarms, Energy measurement and third party device activation/ deactivation. All units come equipped with an SD card which is used to load the software as well as to store site generated alarm and energy data. The Jupiter Solar MMU package contains one box containing the programmable CPU based controller and the memory module loaded on PCBs, and a second box containing the Energy Controller Logic Circuit with 7 current sensor logic circuits (minimum configuration). Additional boxes may be required based on configuration requirements and to measure various energy parameters. All components are designed to work with each other and post installation constitutes the full controller. The users are advised to connect the two units exactly as described in the manual, without which the controller will not work.

## The Intelligent Solar MMU

The AST designed Jupiter Solar MMU is a CPU based fully intelligent device equipped with rule based logic and capable of running an off grid/ grid interfaced solar and solar hybrid site. Many parameters are user defined and remotely programmable using AST's advance NOC software resident on a remote server. Since it can function using an optimal open interface the user is also free to integrate the hardware with his/her own NOC.



Figure 1: Solar MMU card Model Jupiter RTU

The Jupiter Solar MMU functional Capabilities are as below :

### 1. Local Communication

The device communicates locally with all alarm sensors, energy sensors, third party devices for ON/OFF control and can intelligently take all decisions to run the site and maintain optimum energy balance.

### 2. Remote Communication

The equipment is capable of communicating with a remote Network Operation centre via SMS or GPRS and can be programmed to send all information to a server at regular user specified intervals.

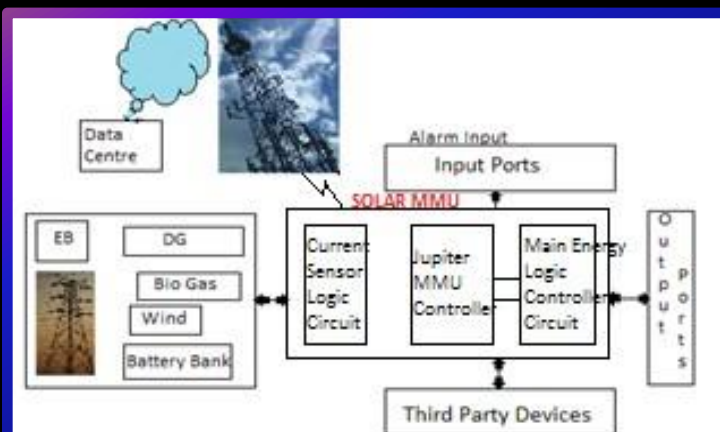


Figure 2: Typical Solar Site

### 3.Remote Alarms

The Jupiter Solar MMU also monitors digital or analog alarms such as Fire and Smoke Alarms, Temperature Alarms and any other NO/NC contact based alarm and relay these to the specified and configured remote server.

### 4.Remote Control

The Jupiter Solar MMU unit can also remotely activate/ de-activate third party devices remotely as well as via pre defined logic computed online by the intelligent controller.

### 5. Remote Energy Manager

Jupiter's intelligent hardware and software is equipped to take on the spot automated decisions on how to optimise the energy generation and consumption for solar hybrid installation so as to improve overall energy efficiency. Key decision making parameters are user defined and stored in the Jupiter Solar MMU's EEPROM (Programmable memory module).

#### Hardware Features

##### Analog Input

The analog inputs receive data from sensors which are used to measure solar intensity, battery temperature, BTS temperature, ambient temperature and DG battery voltage. Additional ports can be provided for specific customer requirements.



Figure 3 : Energy Controller Logic Circuit with current sensor logic circuit (Packet Separately)

### 6. Energy Measurement

The Jupiter Solar MMU hardware, consisting of multiple PCB's comes pre- integrated with online devices to measure complete energy generation and run hour information for all types of DC energy that needs to be monitored. Optional additional hardware measures AC energy generated by third party devices such as DG sets, Wind turbines, Electricity grid etc

#### Digital Inputs

The digital inputs provide information to the Jupiter Solar MMU regarding the state of the various external alarms such as Smoke and Fire, State of DG, Fuel Level and any other customer alarms.

### Digital Outputs

Digital outputs in the form of LEDs and LCD display show information to the user on site which is useful in site operation. LEDs show if the load is on battery or solar, the battery on site is low, DG on/off etc. and also shows communication failure.

### Serial Connections

The serial inputs provide information from on site video cameras, GPS, AC/DC meter, SMPS and Solar battery, GSM radio (internet), Zigbee (internet) and host port debugging.

### Relay Connectors

Relay connectors are used to send signal to start or stop any external devices such as DG sets, Hooters, Fans, Lighting, Cameras. These can be customized to meet all user requirements.

### Controller & Communication

This module collects data from all the site instruments and communicates it over GPRS or SMS as per the protocol. Zigbee interface option permits customers to interface future wireless devices to the Jupiter solar MMU for specific applications like video monitoring and others.

### Local Data Storage

All the events such as Alarms, Site status and reports will be stored. The data is stored on the SD card and can be accessed via USB port or remotely.

## Hardware Specifications – Model Jupiter RTU

<b>Processor</b>	High Speed SMPS/GPRS enabled
<b>INPUT</b>	Multiple types: Analog, Digital, Serial
• Analog	Voltage and Current type. Upto 12 ports
• Digital	12 ports to monitor NO/NC alarms
• Serial	RS 485, RS 232 and USB ports, GSM radio and Zigbee option
<b>Outputs</b>	8 relay output ports to drive external devices.
<b>Data Storage</b>	SD Drive for storage and Query
<b>Display</b>	Intelligent <ul style="list-style-type: none"><li>➤ Graphic Display</li><li>➤ LED indicators</li></ul>
<b>Sensors cum logic controller circuits (Required as per configuration)</b>	AC measurements, DC measurements, Vibration Sensing, Fuel level
<b>Minimum 1 unit</b>	

