Solar Cube
Precision Solar Tracking & Management

Solutions with you in mind
Solar Cube

Solar Tracking & Management Controller

- Out-of-the-box solution
- Easy to set up
- Flexibility to adapt to any installation
- Built-in sun positioning algorithm
- Integrated Ethernet option for remote web access

Solar Cube Overview

The IMO Solar Cube has been developed as a ground breaking, easy to set up solar tracking and measurement controller with the flexibility to adapt to any installation.

The Solar Cube is an off the shelf controller designed for use on either one or two axis solar panel installations to track the sun’s movement and provide optimum panel (or array) positioning. The sun’s position is calculated using the local time and date comparing this with the longitude and latitude location of the solar array. From this data the Solar Cube calculates the ‘zenith angle’ and the ‘azimuth angle’, which together exactly specify the position of the sun in the sky.

To position the array the Solar Cube uses feedback from an electronic compass device connected via RS485 which then activates the solar array’s actuators until the correct position is reached. The compass is mounted directly on the array frame to give accurate positioning information.

With the option of GPS positioning or manual inputting of the array’s location, the Solar Cube is easy to setup anywhere in the world. The Solar Cube is a competitive solution for controlling each array or it can be configured to control up to 4 arrays from one controller providing additional savings. Options for feedback and control from a single control station or via a web server are also available.

Solar Cube also offers data logging facilities using its own internal MicroSD card. Power output can be logged continually to produce daily, monthly and yearly figures. Revenues can be calculated along with CO₂ reduction figures.
Solar Cube Key Features

- 3.5” Monochrome Touch Screen
- 5 Pre-programmed function keys
- Built-in sun positioning algorithm, accurate to 0.1°
- Integrated Ethernet option for remote web access
- 3D Compass input for accurate positioning
- Automatic location and clock updates with GPS
- MicroSD card for data logging
- Password security for all settings
- Error based adjustment with configurable error values for each axis
- Configurable minimum and maximum adjustment angles
- Configurable safety cut-out system
- Configurable twilight settings (returns to morning position automatically)
- Single Axis supports Azimuth or Zenith tracking
- Supports custom inverter serial communications
- Emergency Stop input
- Manual Jog function
- Manual Override key
- Optional Ice and Wind Sensor inputs
- Four motor outputs (For 2 Axis Control)
- Limit Switch inputs for safety cut out
- Optional Washer Control output
- Analog input for power output measurement (CT Connection)
- Optional analog input for light level sensing
- IP65 (NEMA4) CE, cUL, UL
- 10-30VDC supply

Solar Cube Data Logging

- Total kWh produced to date
- Total kWh produced today
- Current Power Output graph (kW against time)
- Yesterday’s Power Output graph
- Yield Values for last 31 days (kWh against days)
- Yield Values for last 12 months (kWh against months)
- Specific Annual Yield

Part Numbers

### Single Array

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOLARCUBE-1A</td>
<td>Single Array Solar Tracker, 1 or 2 axis configurable</td>
</tr>
<tr>
<td>COMPASS-485</td>
<td>3D Postional Compass</td>
</tr>
<tr>
<td>OEM GPS RECEIVER</td>
<td>RS232 GPS Receiver</td>
</tr>
</tbody>
</table>

### Four Array

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOLARCUBE-1A</td>
<td>Four Array Solar Tracker, 1 or 2 axis configurable</td>
</tr>
<tr>
<td>SMT-CD-R20-V3 (x3)</td>
<td>Slave Array I/O Repeater</td>
</tr>
<tr>
<td>COMPASS-485 (x4)</td>
<td>3D Postional Compass</td>
</tr>
<tr>
<td>OEM GPS RECEIVER</td>
<td>RS232 GPS Receiver</td>
</tr>
</tbody>
</table>

Note: Above configuration can be used for each group of 4 Arrays. Where a large number of Arrays need linking a Master Control option is available, call IMO for details.
Precise Solar Tracking

The sun’s position calculation depends upon the current time and date as well as longitude and latitude location of the solar array. The results of this calculation are the ‘zenith angle’ and the ‘azimuth angle’, which together exactly specify the position of the sun in the sky.

$h$ - elevation angle, measured up from the horizon

$z$ - zenith angle, measured from vertical

$A$ - azimuth angle, measured clockwise from north
Solar Cube Physical Features

- MicroSD Card Slot
- Touch screen and functions keys
- Serial ports
- DIN Rail Mounting

Data Logging Facility

Solar Cube also offers data logging facilities using its own internal MicroSD card. Power output can be logged continually to produce daily, monthly and annual figures. Revenues can be calculated along with CO₂ avoidance figures.

Create MS Excel compatible files, backup/restore user programs and change recipe templates.

Access the data remotely using IMO i3-Transfer software. Copy, paste and delete files through Serial or GSM connections, or through the IMO iConnect.

Automate the file transfer process through powerful scripting.