

Innovative small PV system for supplying illumination in rural areas

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IntiKamari, The Sun's gift at Los Andes Peruvian region

Inti Kamari means, in Quechua native language of Perú "the Sun's gift". IntiKamari project has born with the conviction that the best option for rural electrification is to take advantage of one of the greatest natural resources of Perú: the Sun.

In *Los Andes* Mountains, at 3000m high, the Sun irradiates annual average daily values over 6KWh/m² with low ambient temperature and annual small variations of astronomic Sun position, sunrise and sunset, makes this places like a dream for Rural Electrification with Solar PhotoVoltaic Technology.

Estación meteorológica	Energía solar (kWh/m ² /año)	Relativa (%)	Temperatura (°C)	Temperatura (°F)	Latitud (°S)	Longitud (°W)	Altitud (metros)
IntiKamari	6.0	100	10	50	12.5	76.5	3000
Chimay	5.5	92	12	54	12.5	76.5	2800
Chimay	5.0	83	15	59	12.5	76.5	2600
Chimay	4.5	75	18	64	12.5	76.5	2400
Chimay	4.0	67	20	68	12.5	76.5	2200
Chimay	3.5	58	22	72	12.5	76.5	2000
Chimay	3.0	50	25	77	12.5	76.5	1800
Chimay	2.5	42	28	82	12.5	76.5	1600
Chimay	2.0	33	30	86	12.5	76.5	1400
Chimay	1.5	25	32	90	12.5	76.5	1200
Chimay	1.0	17	35	95	12.5	76.5	1000

Meteorological data at Peruvian Sierra source: Atlas de Energía Solar del Perú



Living in the heart of Los Andes

In Ancash region, at the heart of Los Andes ,hundreds of small communities are located at high places, remoteness, without any electricity supply and difficult access to its locations, with reduced energy consumption needs and low purchasing power. Also, don't exist any road infrastructure, found isolated.



AGNEUS® AGCD840V20 Street Light Controller

AGCD840V20 is an MPPT Solar Battery Charge Controller for 36-cell PV modules and 12V Lead-acid battery, designed and manufactured by AGNEUS PV:

- Low cost solar 12V battery charge controller
- Specifically designed for small PV applications
- MPPT Cutting edge power conversion solution
- Provide reliable electric power and assures system long life .



Field experience – Coal mine in Mancos



Field experience - Public illumination in Quillo



Cutting-edge Solar Battery Charge Controllers for Small PV applications

AGCD840V20 Street Light Controller is the first of a new revolutionary low-cost Solar Battery Charge Controllers designed and manufactured by AGNEUS PV www.agneus.com



12V Lead-acid Battery Solar Charge Controllers:

- AGCD840V20 Street Light Controller: 100Wp 30Voc MPPT with lighting schedule control
- AGCD830V20 MPPT Controller: 60Wp 30Voc lowest-cost MPPT solar battery charger
- AGCD8100HV Thin-Film Controller: 60Wp 100Voc High Voltage MPPT solar battery charger for Thin-Film modules, wide V_{MPPT} range: 20V till 95V. Street Light Controller option available.

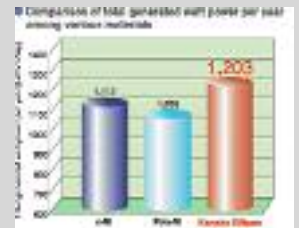
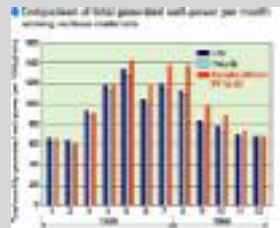
24V Lead-acid Battery Solar Charge Controllers:

- AGCD5100HV Thin-Film Controller: 120Wp 100Voc High Voltage MPPT solar battery charger for Thin-Film modules, wide V_{MPPT} range: 30V till 95V. Street Light Controller option available.

FIRST WORLD'S THIN-FILM SOLAR BATTERY CHARGER FOR SMALL PV

AGNEUS® AGCD8100HV is a High Voltage MPPT Controller for 12V Lead-acid battery, specially optimized to work with Thin-Film modules. This is the first World's Thin-Film Battery Charge Controller designed for Small PV applications:

- Takes advantage of the lowest \$/Wp cost . Thin-Film modules are, at least, 30% cheaper than standard 36-cell mono or poly crystalline modules.
- Superior performance of Thin-Film technology under High temperature conditions
- High PV voltage operation, till 100Voc. Wide MPPT input range: 20V till 95V
- Street Light Controller option is available.



Comparative of Thin-Film Silicon technology vs. crystalline technology source: Kaneka

Photovoltaic MPPT 12V battery charger – plug & play

Maximum Power Point Tracking (MPPT) for solar battery charge regulation, allows to get the maximum electric power from a photovoltaic module. AGNEUS® predictive real MPPT algorithm allows to increase the energy yields till 30% with a 36-cell crystalline module, if compared with conventional serial or PWM solar battery chargers.

PWM Switch mode is included for optimal performance. MPPT battery chargers have also disadvantages, such a minimum working power and extra loss in electronics. The power conversion stage includes a PWM working mode for this situations, and is able to put the electronics in an active stand-by mode, so the electronic consumption is reduced at minimum.

Assures Lead acid Battery Longest Life-cycle. AGNEUS® own design algorithm 4 states deep battery charge with current active control put special emphasis on battery SoH: in order to prevent failure, PV module and loads are controlled to protect battery from overload, overcharge and extended uses without finishing a deep battery charge.

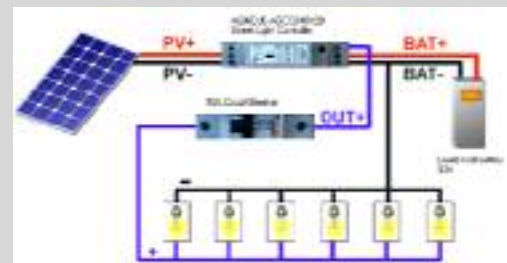
Easy installation and full "plug & play" operation. Case construction in DIN-RAIL style, reduced dimensions and weight. It's not required any adjustment or program operation.

Supplying public illumination - automatic schedule control

During the day, the solar energy is captured by a PV panel and stored in a 12V 100Ah lead acid battery through the MPPT battery charge converter: it makes possible the battery to be charged at the photovoltaic MPP.

At Sunset, six 12V / 15W CFL lamps are started up automatically during a minimum period of 2 hours and maximum of 4 hours, as a function of battery SoC.

Before Sunrise, if battery SoC is still over 50%, the lamps are started again during one hour.



Solar public illumination in Quillo – Ancash – Perú