

# Solar Power Systems

For Mission Critical Applications



THE POWER OF QUALITY



**Solarcraft**<sup>™</sup> THE POWER OF QUALITY

Solarcraft, Inc. | [solarcraft.net](http://solarcraft.net) | 877.340.1224 | [sales@solarcraft.net](mailto:sales@solarcraft.net)

# THE POWER OF QUALITY

Since 1994, THE POWER OF QUALITY has guided the way we do business. Solarcraft began by designing and building small solar power systems for *critical electronics in remote locations*. We continued to develop our capabilities, and we now offer full-service Engineering, Fabrication, Integration, Programming and Field Service.

QUALITY — in design, materials, workmanship, service, and people are fundamental to our business approach. Solarcraft takes pride in continually improving our processes and products, seeking innovative solutions, and building the best team of employees. To our customers, the Solarcraft name is synonymous with quality. That's what we mean by **THE POWER OF QUALITY**.

## Safety and Innovation

We build our enclosures and shelters with safe and convenient features such as door pistons to keep doors from slamming shut, easy-to-open latches, fold-down laptop surfaces, battery terminal shields, and more.

Quality doesn't exclude economy. In a competitive market, we design solutions that facilitate efficiencies in manufacturing without compromising materials and workmanship. We identify and test innovative products that improve system performance and reliability.

As a result, we deliver long-term savings and built-to-last products for our customers' mission-critical operations.

Because we believe in the products we build, all our systems are covered by an industry-best, 5-year Warranty on materials and workmanship.

## Capabilities

- Engineering and Design
- Complete Fabrication
- Electrical Integration and PLC Programming
- CID2 Standards for Hazardous Areas
- Commissioning and Field Service

*The bitterness of poor quality remains long after the sweetness of low price is forgotten.*

-Benjamin Franklin



Pictured left to right: 2006 — 120-W, 2-battery RTU system with radio and antenna | 2003 — Unmanned offshore RTU system with solar array mounted outside the platform deck rail to conserve space | 2009 — Tactical military-grade portable power system with solar panels, batteries, and masts hardened for transport in rugged remote areas | 2007 — 500W solar and battery power for radio tower | 2009 — Testing and inspection.

Established **1994**



## Our Factory

Solarcraft designs and builds power solutions in our 36,000 square-foot facility which encompasses Engineering, Manufacturing, Procurement, Sales, and Administration. We welcome customers to get to know us by touring our factory and meeting our team.

Our Engineering department is key to product development and innovation. Not only does the team engineer our solutions, but they produce all fabrication and schematic drawings. In addition, they identify and evaluate new components, develop new product designs, and work with Manufacturing to streamline processes.

Our Fabrication area features an Amada laser cutter, press brake, and welding bays. We design and manufacture all our metal components — from skid bases to enclosures, shelters, switch racks, backplanes, brackets, and racking.

In our UL 508A Certified Wiring and Integration area, the latest automated machines precision cut, label, and ferrule batches of wire directly from schematic drawings, making panel wiring and component integration accurate and efficient. Final Assembly, Testing and Inspection complete the manufacturing process.



Pictured from top left to bottom right: Design and Engineering | Fabrication area with Amada Laser Cutter and Press Brake | Amada Laser at work on aluminum sheet | Aluminum Welding bay | Ferruling machine with precision cut wires | Electrical panel and component integration | Final Assembly, Inspection, and Testing | Solar power system staged for testing.



## What Makes a Reliable Solar Power System?

Solar power, when done correctly, is one of the most cost-effective, low-maintenance, and reliable solutions for powering remote electronics in today's connected world.

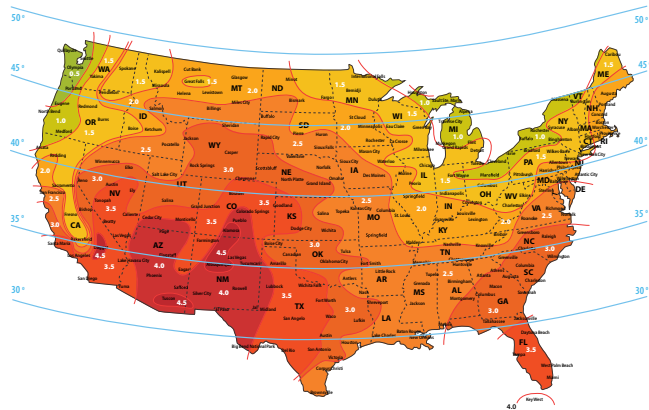
### Location

Solar resource varies a great deal based on local weather patterns and the system's location relative to the equator. The closer to the equator, the longer the daylight hours and greater solar potential.

We reference historical weather data of winter sun hours, as well as weather patterns for a system's specific location. Systems are sized based on winter sun hours, not average annual sun hours, so that shorter winter days and overcast skies do not affect operations. Even when seasonal solar resources are at their lowest, our systems are designed to continue operations as normal.

### Quantifying the Load

We engineer each system to order, based on the total component load, system operation times, (continuous or intermittent operation), and required days of system back-up. We ensure each component's power requirements, cycle time, and power conversion losses are assessed and included in the total load calculation.



#### Solar Insolation Map of Typical Winter Peak Sun Hours

To calculate a system's solar array size, potential solar power is calculated based on winter peak sun hours, not an average of annual sun hours.

The information on this map is interpreted from the National Renewable Energy Laboratory, [www.nrel.gov](http://www.nrel.gov). Measured in kilowatt hours per square meter per day (kWh/M<sup>2</sup>/day). Standard solar panel tilt angle = Latitude + 15°

Pictured on facing page: Remote metering and communications at wellhead | Remote rock slide monitoring system in Colorado | Work barge installing solar array and battery enclosures for obstruction lighting on a high tension power line water crossing | Cathodic protection for a pipeline crossing brackish coastal waters | Hybrid 480V/120V/24V systems for block valve application, pictured with concrete anchor blocks for stability.

### The Battery Bank

The battery bank is the heart of the power system, storing and discharging power to operate the load. Battery performance and longevity depend on many factors. Ambient temperatures in summer and winter affect battery capacity, as do charge and discharge cycles. To be sure that the load is securely powered, we design the system with sufficient battery capacity to power the load while maintaining a healthy level of charge.

### Fabrication

Solarcraft builds rugged enclosures to order in our fully equipped metal fabrication shop. Our enclosures are purpose built, dual compartment Type 3R and Type 4X with separate Type 3R vented battery and Type 4X sealed electronics compartments.

We design our solar arrays for high wind loads. When possible, we integrate the arrays to the enclosure to reduce footprint, and to take advantage of the shade from the array. Large arrays are mounted to metal skids, and if needed, secured to specially designed concrete anchor blocks which we can manufacture and ship with the system.









## Solar Power Applications

Much has changed since Solarcraft began building industrial solar power systems in 1994. At that time, solar panels and batteries were costly, but solar power was the most economical solution to deliver dedicated electric power to remote sites where utility power was unavailable.

Today, Solar is widely accepted for many more commercial and industrial applications. Solar panels and battery technologies have vastly improved, electrical devices are smaller and more efficient, and modern LED lighting all make solar a viable power source for more applications.

The environmental benefits of solar power are driving interest in solar as a primary source of power, even where utility power is available. As a result, the opportunities to utilize solar power are greater than ever.

### Communications

- LoRaWAN Gateways and End-Nodes
- Radio and Microwave Communications
- Wireless Hot Spots, Wi-Fi, Private LTE, and CBRS

### Environmental

- Air Quality Monitoring
- Flood Monitoring
- Seismic Monitoring
- Structural Integrity Monitoring
- Weather Monitoring

### Industrial Grid-Tie Solar

- For Carbon Offset and Renewable Energy Certificates (REC's)
- Electricity Buy-Back

### Obstruction Lighting

- Broadcast and Communication Towers
- High Tension Power Lines
- Wind Turbines

### Oil and Gas/Pipeline/Water/Wastewater

- Block Valve Actuation
- Cathodic Protection
- Flow Metering
- Pipeline Custody Transfer
- PLC and RTU Systems
- Wellhead Controls

### Security

- Emergency Alert Boxes
- Gate Access
- Mustering Stations
- Perimeter Monitoring
- Security Cameras

### Transportation

- Rail Car Tracking
- Traffic Management
- Traffic Monitoring



Pictured this page above and right: Solar powered water pumping control system | Solar powered seismic monitoring systems staged for testing and shipment.



Pictured on facing page: Solar powered Mustering Station for chemical plant | Solar powered weather data station | Solar powered leak detection and air quality monitoring system | Pipeline RTU and communications system | Skid mounted solar power systems lined up for testing | Solar powered valve actuator system | Solar power for onsite safety lighting.





## Industry Leading 5-Year Warranty

At Solarcraft, all our power systems come standard with a 5-Year Warranty. Solarcraft warrants that your system will be free of defects in workmanship and materials at the time of shipment, for a period of five years from the date of shipment.

We are proud to offer this industry-leading, 5-Year Warranty to our customers for no additional cost.

## Additional Capabilities and Expertise

- AC and DC-UPS Backup Power Systems
- Battery Cabinets and Racks
- Bus Stop/Switch Racks
- Concrete Anchor Blocks and Heavy Duty Skids
- Enclosures – Standard, Custom, and Type 3R and 4X
- Industrial-Grade Modular Solar Arrays and Skid Solutions
- Modular Thermal-efficient Equipment Shelters
- Movable Electrical RTU Shelters/Enclosures



Pictured clockwise: Solar powered valve actuator | Innovative 4-door battery enclosure and base with integrated solar array for 480V 3-phase power supply, enclosure view and solar array view | Solar power system kits on pallets, ready for shipment.

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12300 Dairy Ashford Road, STE. 100 | Sugar Land TX 77478 USA

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