



# UCF Case Study

The Florida Solar Energy Center (FSEC) is a research institution of the University of Central Florida (UCF). The Photovoltaics and Distributed Generation Division seeks to provide the general public and professionals with accurate and current information about alternative energy use and production.

Presently, there are limited choices for small utility-interactive photovoltaic (PV) inverters in the US market, and the performance and overall reliability of this equipment has been less than satisfactory. To address these needs, and to promote the development of new products, the SERES division of FSEC will develop and implement a systems approach to inverter testing, which complements the interconnection and power quality issues addressed in testing at Sandia's labs and at UL for product listings

That's where Solar-Ray, Inc. comes in. They designed the two different PV arrays on the Harris Engineering building on the Main UCF campus to test two types of invertors. One array uses 3 string inverters and the second array is using 30 micro inverters.

#### Technical Objectives:

- Identify key areas of performance and reliability improvement needed for utility-interactive PV inverters.
- Develop test standards, report format and content for various inverter tests and results.
- Characterize the DC-AC power conversion efficiency of inverters as a function of input and output load levels, temperature and other variables.
- Characterize the performance of inverters under varying array input voltages within manufacturers' nominal operating windows.



*Location: University of Central Florida, Harris Building*

*Date Installed: July 2009*

*PV System Designer: Solar-Ray, Inc.*

*Contact: Michael Brown*

*System Size: 21kW*

*Module: 120 Suntec Modules*

*Inverter: 3 SMA Inverters & 30 Enphase micro-inverters*

*Overall Cost: \$158,725.00*

*Rebates/Incentives: Qualified for the Full Florida State Rebate of \$100,000*

*Cost to Customer: Undisclosed*

*Estimated kWh per year: 43,800kWh per year*

*Estimated \$ Saved per year: \$5,256.00 per year at today's electrical rate*