

# How a solar rooftop contractor ensures quality panel installations every time

Clamp meters (</en-us/learn/blog/clamps>), Renewable energy (</en-us/learn/blog/renewable-energy>)



Image courtesy Cape Fear Solar Systems

**Name:** Robert Parker, Project Manager

**Company:** Cape Fear Solar Systems

**Tool:** Fluke 376 True RMS Clamp Meter

**Key benefits:** Reliable, solid, durable

- Prevents mistakes by verifying correct voltage and amperage during solar installations
- Saves time by verifying each string has the correct number of panels before wiring into the junction box
- Identifies or eliminates possible problems through process of elimination

Cape Fear Solar Systems (CFSS) only uses the best of everything—best solar panels, best inverters, and for them, only the best meter—Fluke’s 376 True RMS Clamp Meter. (<https://www.fluke.com/en-us/product/electrical-testing/clamp-meters/fluke-376-fc>)

"We try to get the top-of-the-line for everything," said Robert Parker, senior project manager for CFSS. "For instance, we use SunPower (<https://us.sunpower.com/>) panels, the most efficient ones on the market. We try to stick to that theme for most things we purchase, including Fluke's 376. It's a reliable, durable and solid tool."

As senior project manager, Robert helps streamline all CFSS rooftop solar installations from inception to completion. Once a customer decides to move forward with a project, he works with the company's internal operations to ensure permits are ready, interconnection to utilities are correct, the electrician is scheduled, and then once the system is turned on, he maintains customer communications throughout the CFSS 25-year warranty.

## **Equipment improvements mean solar savings**

Just a few years ago, solar system installations took one to two weeks; now they only take a day and a half to two days. What's changed? Mainly, the solar testing equipment (<https://www.fluke.com/en-us/products/electrical-testing/best-solar-energy-industry-tools>) surrounding the solar industry. Through improved manufacturing processes and consolidation of balance-of-systems equipment such as rail systems, solar panels and panel inverters, installations have become faster and simpler, consequently lowering the overall cost of a solar system.

## **Clamp Meter testing, measuring and troubleshooting**

Inverters are essential to solar systems because they transform the DC power from the solar panel into usable AC power for safe transmission of electricity to the utility's grid connection. CFSS uses the Fluke 376 to test and measure a few different types of solar panel installations. For example, single panels fitted with built-in microinverters or power optimizers, which when strung together create an array that can be connected to one central inverter. These panels are mainly used in commercial installations.

"We're using the Fluke meter to measure voltage and amperage," said Robert. "When we're putting down a string of panels, especially on a DC system, technicians need to make sure the plans match up with how many panels are going into each string for the inverter and verify it's not overloaded or getting too much voltage on one string creating an imbalance."



Image courtesy Cape Fear Solar Systems

"By using a Fluke meter, we can check the aggregate voltage in a series of all the panels and know that we have the right number of panels in that specific string. So, it's helpful from a time-saving and verification perspective."

During installation, if CFFS discovers an issue with an optimizer or microinverter, the Fluke 376 meter can help eliminate possible reasons for the problem.

"During troubleshooting, the installer first disconnects the solar panel leads, then uses the Fluke meter to measure the panel's DC voltage to ensure it's equal to the panel's nameplate open circuit voltage," said Robert. "Next, our installer uses the 376-clamp ammeter function to make sure the current matches the correct short circuit current of the module. If the installer sees that both measurements are consistent with the panel's rating, then they know the issue is coming from the modular level device and needs to be replaced."

Robert recalls a time when they didn't take measurements at the end of a string of panels and later saw at the inverter they weren't getting the right power.

"We saw that not all of the optimizers were reporting correctly," said Robert.



Image courtesy Cape Fear Solar Systems

"So, we had to go back up on the roof, take apart the panels and find the misconstruction. It's extremely costly and an extreme time waster. That's why taking measurements with the Fluke meter is integrated into part of everything we do."

## **Leveraging local connections**

CFSS just recently made Solar Power World's (<https://www.solarpowerworldonline.com/>) Top Solar Contractor's list, ranking sixth in North Carolina and number one in Southeastern North Carolina for residential solar rooftop contractors. Robert attributes much of the company's success to the trust and relationships they've built with customers and within the local community.

"Knowing the ins and outs of permitting processes and the people that can help gives us a big advantage over large national solar companies," said Robert. "Our focus is local, and we have experience working with the region's inspectors and utilities. It's been great for our growth process and hopefully helps the solar energy growth in the area."