Zone Monitoring vs. String Monitoring

Flexibility in PV system monitoring: Customized to your needs

If a string or module in your PV power plant fails, how quickly, precisely and detailed do you want to be notified and what is the information worth to you?

This is the question that PV system operators have to answer when deciding how to monitor the PV modules and strings in their power plant. There are two approaches: integrated zone monitoring or string monitoring in the field.
String Monitoring

String monitoring tracks data on individual strings in the PV power plant and reports malfunctions directly to the inverter, which then provides detailed information on the failed string through the respective software.

Zone Monitoring

Zone monitoring aggregates module strings into string combiners. The output current of each string combiner is measured and monitored on the DC input side of the central inverter. If an error occurs, the inverter software flags the zone that has the failed string or whose current output has moved too far from the average current at the DC inputs. The error is then specifically located on-site.

In Germany, PV power plant monitoring has been handled in one of two ways: detailed, but costly string-level monitoring or a complete absence of monitoring—and thus no monitoring costs. But now Germany, Europe’s largest photovoltaics market is starting to adopt the less expensive North American practice of zone monitoring.

However, costs are obviously not the only consideration. Investors’ and PV system operators’ requirements also play a key role. String monitoring is the clear choice if the priority—for financial or other reasons—is on maximum safety and maximum availability of all strings. This is the case, for example, if the profit from the feed-in tariff is much higher than the installation cost of the various string monitoring components.

Zone monitoring is the better option if detailed monitoring is not necessary and the troubleshooting costs are negligible compared to the cost of investing in string monitoring.
Benefits of Zone Monitoring

- Lower installation costs and risk of failure (fewer communication cables in the field)
- Direct measurement of DC input currents at the inverter, combiner and breaker failures are reliably detected
- Less expensive (savings up to 40 percent possible)

Benefits of String Monitoring

- Precise monitoring of individual strings for accurately locating and quickly fixing system faults
- Safety feature for PV power plants required by many investors and PV system operators
- String monitoring technology can increase yield depending on the feed-in model

SMA Central Inverter and Monitoring Options

SMA now offers both monitoring options. Sunny Central CP-XT central inverters and the SMA Utility Power System support string and zone monitoring.

For detailed technical information, contact Powerplants@SMA.de directly.