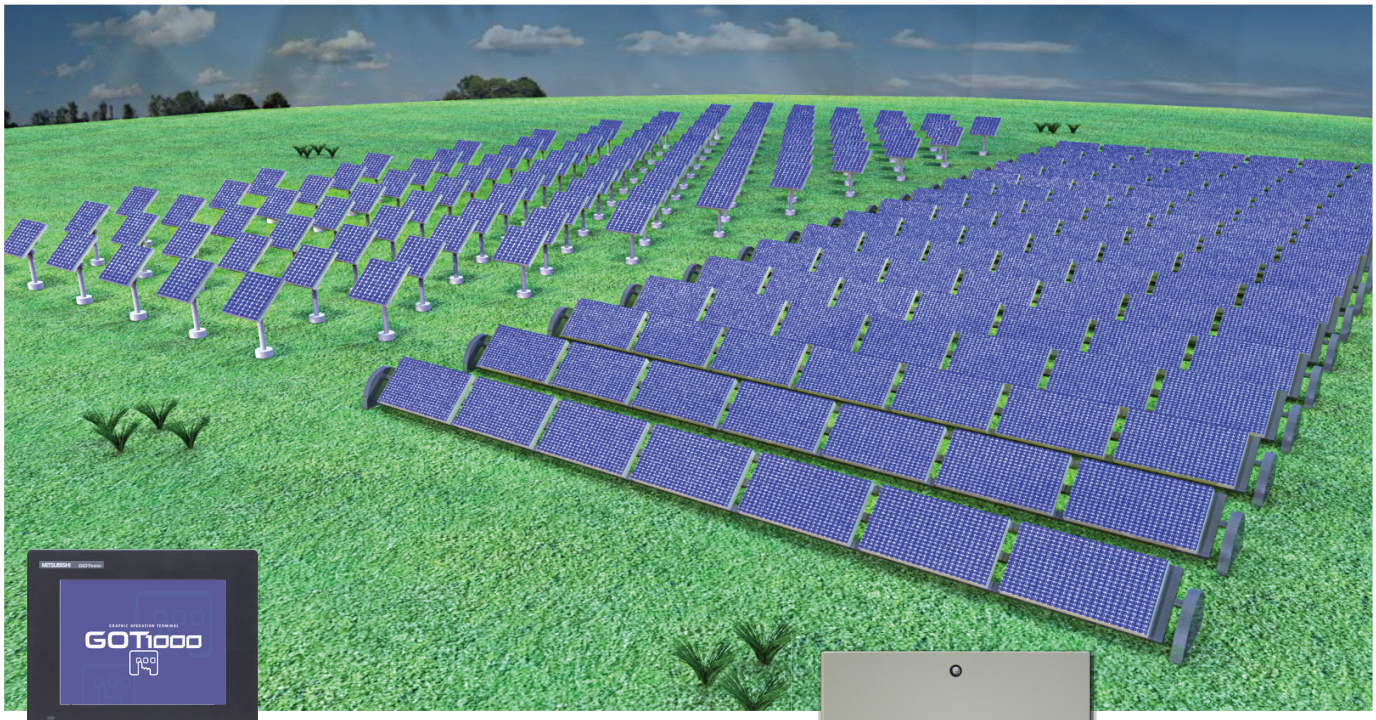
Mitsubishi Solutions

Solar Tracking Control

Mitsubishi Solution

PLC: **FX3U-PLC + FX3U-4AD** VFD: **D700** Graphic Operation Terminal: **GT1055**
Option: **Solar Packaged Solution**



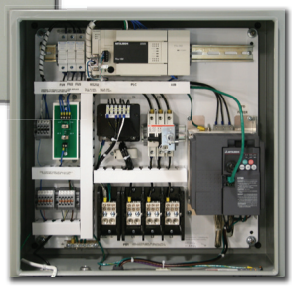
GT10 HMI

FX3U PLC

FX3U-4AD

D700 VFD

Solar Packaged
Solution Option



Example Applications

The application focuses on principles used in the following active tracking installations:

- Horizontal axis tracking
- Vertical axis tracking
- Polar tracking
- Two axis mount tracking

Overview

Solar panel tracking systems optimize energy output of photovoltaic panels by positioning them to follow the sun's path throughout the day. The sun's position in the sky varies both with installation location, the seasons, and the time of day. Tracking systems are being used increasingly as purchasers of solar systems understand that the cost of energy over the life of the panel is more important than the initial installed cost per watt. Recently, the solar industry has been using Levelized Cost of Energy (LCoE) as the main measuring stick of solar power plant efficiency. This figure looks at all costs associated with a solar panel installation over its entire lifespan, including initial installed cost, degradation in panel efficiency over time, and on-going maintenance and trouble-shooting. Compared with fixed-position installations, solar tracking systems lower the LCoE of a solar panel installation, making solar a viable long-term option to other energy sources.

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Features	Advantages and Benefits
FX3U PLC Trigonometric Functions: Regular and inverse floating point sine, cosine and tangent as well as radian and degree conversion	• Complex math functions for calculating the solar azimuth and zenith angles
FX3U PLC Real Number Processing: 32-Bit data handling	• High precision data manipulation to accurately calculate solar position
PLC to PLC Communication: Ethernet and serial communication for improved tracker data management	• Serial communications and networks allow for fast time synchronization, maintenance and monitoring of the tracking station
FX3U PLC - Analog Control: High accuracy with up to ±0.3% accuracy	• Precise inclinometer reading for accurate array positioning • Inputs for monitoring excessive wind and temperature at installation
FX3U PLC - Positioning: Dedicated VFD protocol for advanced panel positioning	• Continuous panel movement monitoring • Simplified tracker programming • Reduced tracker downtime during maintenance
FX3U PLC – Robust Security for Program Protection	• Prevents unauthorized access to solar tracker algorithm while allowing routine maintenance checks
GX Works2 – Function Block Creation	• User defined function blocks and libraries for simple replication of code to reduce tracker programming errors and time
D700 VFD – Self Diagnostics: • Monitoring of internal components prevents unnecessary downtime • System protection and overload functions	• Enables accurate planning for maintenance checks of the trackers • Avoids damage to tracker components
D700 VFD - Unmatched Product Reliability: • 5 year warranty • In-field product installations with over 25 years service life	• Prolonged tracker life and minimum maintenance
GT10 series HMI Connection: IP67F compliant	• IP67F compliancy ensures improved product reliability when exposed to harsh environments where trackers may be installed

Customer Installation Base

- *Thousands of Mitsubishi solar tracker installations with 0 failures to date.*

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