ADVANTECH

Enabling an Intelligent Planet

Empowering Solar Operations Through Smart Technology

In the evolving landscape of green energy, synergy between industrial technology advancements and infrastructure is pivotal for performance, sustainability, and efficiency.

Advantech offers comprehensive technology solutions for field asset monitoring, machine-to-machine communications, and a solid industrial IoT data framework for green energy architecture and solar operations management. Industrial IoT framework is ideal for handling solar operations, building a solid foundation for data acquisition, processing, and visualization. When you partner with Advantech, you're choosing a leader in industrial hardware for the solar industry. With a commitment to innovation and expertise in industrial connectivity, Advantech is ready to help clients looking to elevate operations and asset management.

Real-World Case Studies

Building a Solar Monitoring System for Dubai International Airport

- End-to-end solution enables real-time monitoring in the solar glass facilities to effectively reduce carbon emissions and operational costs in a smart manner
- Cloud server directly adjusts equipment temperature in response to local conditions, maximizing energy efficiency

Edge Data Acquisition Improves Real-Time Monitoring Efficiency

- Remote access and real-time acquisition of data, including radiation, temperature, humidity, and wind direction, optimizes field asset management and efficiency
- Data transmitted to a central management system via Ethernet, Wi-Fi, RS-485, and additional interfaces

Data Acquisition Solution for Distributed Solar Power Stations

- Based on RISC-technology, an industrial IoT gateway supports multiple network protocols with a design for safe operation in harsh environments
- Automatically resumes data transmission on network reconnection to ensure data integrity and accuracy

Distributed Solar Power Station Monitoring System

- Locally qualified for seamless real-time process monitoring of station equipment -- user-friendly data analysis interface ensures stable and reliable system operation
- Easy maintenance with unified, open-source management software.

Asset Monitoring Architecture

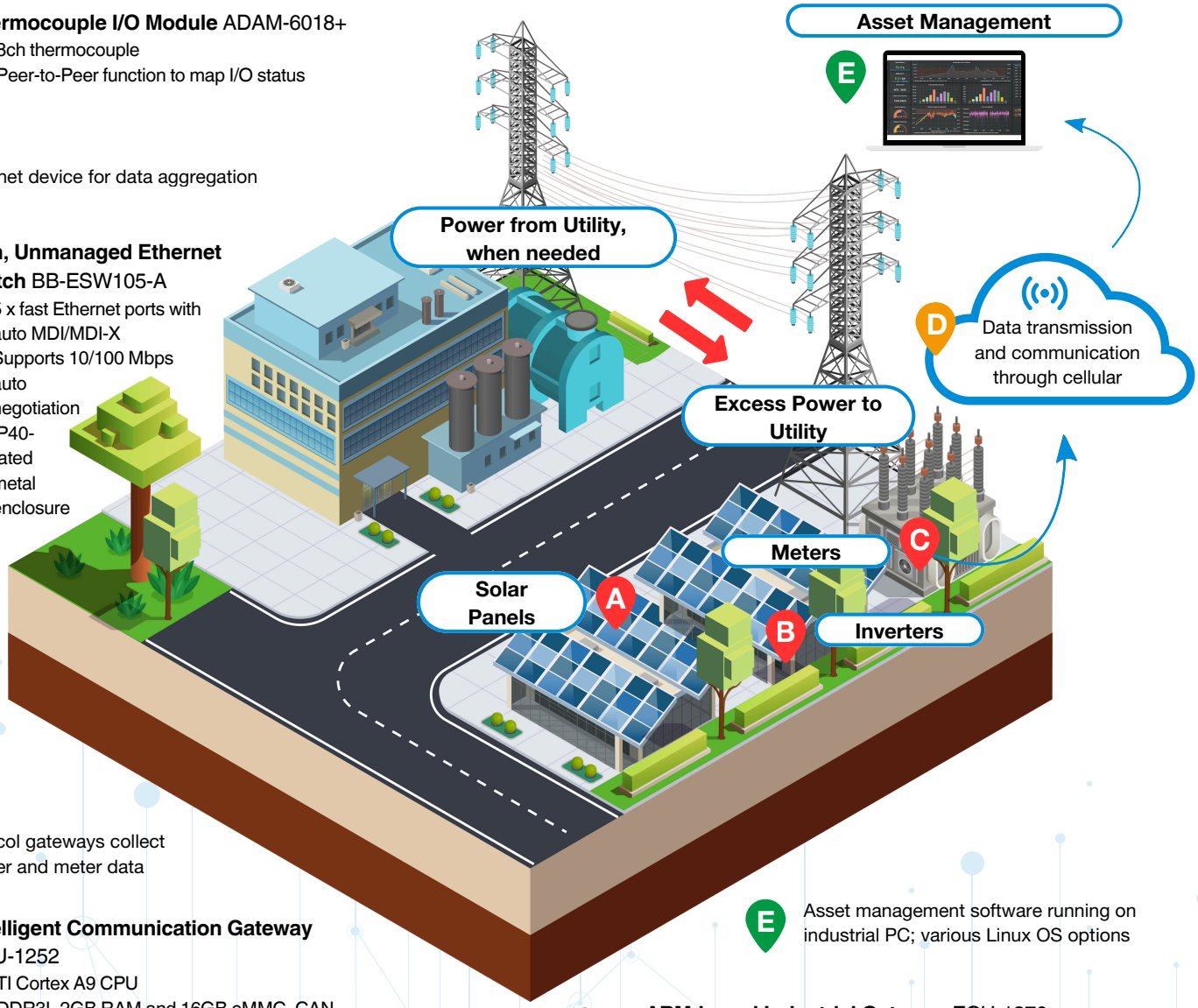
A I/O to collect solar panel condition data for monitoring like temperature, shade sensors, humidity, etc.

Ethernet I/O Module ADAM-6017
- 8ch analog input (voltage or current) /2ch digital output
- Protocols: MQTT (TLS), SNMP, Modbus TCP, RESTful API, ASCII

Thermocouple I/O Module ADAM-6018+
- 8ch thermocouple
- Peer-to-Peer function to map I/O status

B Ethernet device for data aggregation

Slim, Unmanaged Ethernet Switch BB-ESW105-A
- 5 x fast Ethernet ports with auto MDI/MDI-X
- Supports 10/100 Mbps auto negotiation
- IP40-rated metal enclosure



C Protocol gateways collect inverter and meter data

Intelligent Communication Gateway ECU-1252
- TI Cortex A9 CPU
- DDR3L 2GB RAM and 16GB eMMC, CAN
- Protocol conversion: OPCUA , BACnet, MQTT, Modbus, IEC 60870-5-101/103/104, IEC-61850 (by license)

Intelligent Communication Gateway ECU-1251 V2
- TI Cortex A9 CPU
- 2GB RAM/16G eMMC
- Protocol conversion: OPCUA , BACnet, MQTT, Modbus, DNP3, IEC 60870-5-101/103/104, IEC-61850 (by license)

D Data transmitted through cellular to Asset Management Software

Cellular Router ICR-2000/2400 Series
- LTE Cat. 4 cellular technology
- Equipped with basic interfaces; up to 2 Ethernet 10/100 ports

E Asset management software running on industrial PC; various Linux OS options

ARM-based Industrial Gateway ECU-1370
- NXP i.MX8M Quad Core Cortex A53 1.3G CPU
- DDR4 4GB RAM, 32GB eMMC for system storage
- 1 x RS-232/485 isolated serial ports, 1 x CAN

Small-size Industrial PC UNO-137 V2
- Intel® Atom® x6413E and x6425RE
- Onboard TPM 2.0 provides hardware-based security
- Wide operating temperature range (-40 ~ 70 °C/-40 ~ 158 °F)