Winerva System Service

Industrial IoT, Energy Management and AI Integration

Winerva System Service helps companies integrate equipment, energy data and AI applications into practical systems that can be monitored, measured and continuously improved.

We provide more than standalone software. From requirements discovery and equipment connectivity to data integration, dashboards and ongoing maintenance, Winerva helps deliver an end-to-end solution.

> This is a customer introduction. Actual functions depend on site equipment, data sources and the agreed implementation scope.

1. Common Business Challenges

- Equipment data is scattered across multiple systems.
- Energy usage is only reviewed after the fact.
- Solar, grid and equipment energy data are not integrated.
- Carbon information requires manual preparation.
- Operators discover equipment alarms too late.
- Existing equipment works, but lacks a modern data interface.
- Teams need a practical starting point for digital transformation.

2. What Winerva Provides

Industrial IoT Data Integration

Winerva can integrate:

- Sensors, meters and submeters
- PLC and SCADA systems
- Solar inverters and energy storage
- Keyence and industrial equipment
- EtherNet/IP, Modbus TCP／RTU
- MQTT, OPC UA and REST API
- Existing databases and file-based data

Connectivity methods are selected according to the project, site environment and existing systems.

Real-time Monitoring Dashboard

- Equipment online／offline status
- Temperature, humidity, voltage, current and power
- Real-time and historical trends
- Equipment comparison
- Alarm and event status
- Desktop and mobile access

Solar and Energy Management

- Real-time solar generation
- Daily and monthly generation
- On-site solar self-consumption
- Grid import and export
- Solar share of total energy usage
- Energy efficiency analysis

Carbon Information and Management

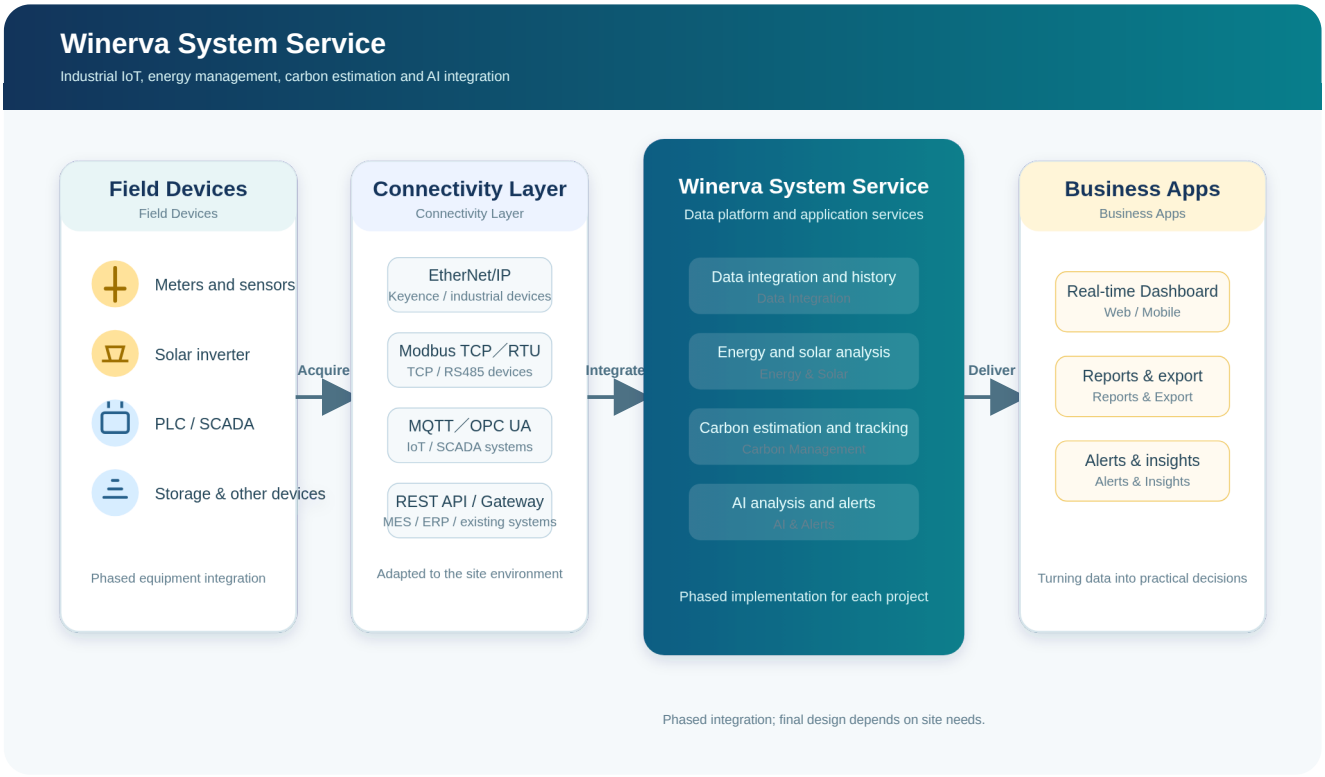
- Scope 2 grid-emission estimates
- Solar avoided-emission estimates
- Daily and monthly carbon trends
- Equipment and site comparisons
- Emission-factor source and period tracking
- Carbon targets and actual performance

Carbon values are clearly identified as estimates, with the calculation method and emission factor shown.

AI and Automation

- Anomaly detection
- Trend prediction
- Maintenance reminders
- Production and energy analysis
- Automatic reports
- Machine vision and quality inspection

3. System Architecture



Winerva System Service architecture

The system consists of four layers:

1. **Field devices**: meters, sensors, PLC／SCADA, solar inverters and energy storage. 2. **Connectivity layer**: EtherNet/IP, Modbus TCP／RTU, MQTT, OPC UA, REST API and gateways. 3. **Winerva System Service**: data integration, energy analysis, carbon tracking, AI analysis and alerts. 4. **Business applications**: dashboards, reports, exports, alerts and decision support.

The actual architecture is evaluated according to equipment, data sources, network environment and project scope. Customers do not need to replace every existing system at once.

4. Implementation Process

Step 1: Requirements Discovery

Understand equipment, data sources, management goals and current pain points.

Step 2: Site and Data Assessment

Review protocols, data quality, network environment, permissions and security requirements.

Step 3: Scope Definition

Define the first-stage equipment, metrics, dashboard, alerts and reports.

Step 4: System Implementation

Build connectivity, data models, screens, calculations and user permissions.

Step 5: Testing and Acceptance

Verify data accuracy, energy flows, alarms, carbon calculations and user workflows.

Step 6: Training and Maintenance

Provide user training, documentation, troubleshooting and future expansion services.

5. Typical Deliverables

- IoT dashboard
- Equipment and energy data integration
- Solar and grid energy analysis
- Carbon estimation module
- Alarm and event records
- CSV or report export
- API or data exchange interface
- User permissions
- Training and operating documentation
- Maintenance and expansion services

6. Suitable Applications

- Manufacturing plants
- Sites with solar or energy storage
- Industrial energy management
- Carbon data preparation
- Existing SCADA or equipment-data environments
- AI, machine vision and smart manufacturing projects

7. How We Work

Winerva can provide:

- Consulting and requirements planning
- Proof of concept
- Single-device or single-site implementation
- Industrial IoT system integration
- Energy and carbon dashboards
- AI application integration
- Custom software development
- Maintenance and future expansion

Winerva System Service: turning equipment data, energy information and AI into practical business value.