# WATTMORE

Intellect EnForm™

Monitor and control your solar and storage assets on one unified, AI-powered dashboard

Intellect EnForm is a next-generation Solar, Storage and Beyond Data Acquisition System (DAS) and Energy Management interface that combines secure, ruggedized field hardware with enterprise-grade cloud analytics. EnForm enables real-time monitoring, control, and optimization of solar, storage, and energy assets across portfolios.

With Solstice, our integrated AI O&M Agent, operators gain proactive insights, predictive analytics, automated reporting, and decision-making support for maximizing system uptime, maintenance ROI, and compliance.
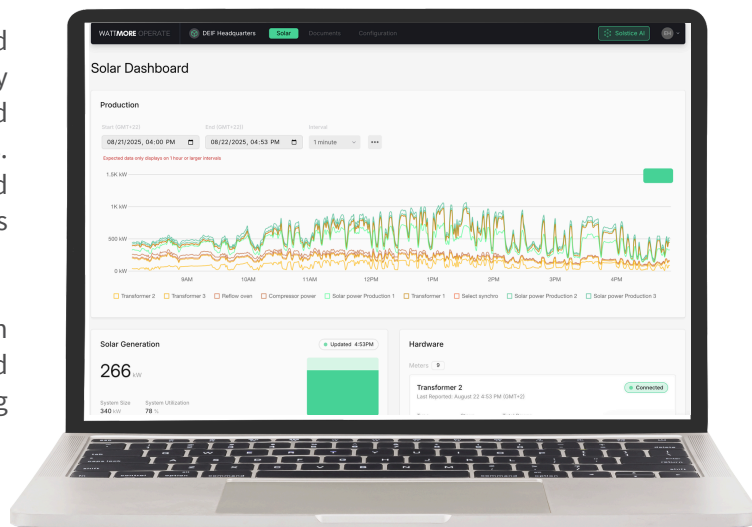
Key Features

AI-Powered Monitoring
- Solstice AI Agent for anomaly detection, forecasting, and operator guidance
  - Automatic normalization
  - Real-time weather adjusted estimation vs real-time weather adjusted actual
- Alert prioritization and root-cause analysis
- Predictive maintenance recommendations
- Maximized ROI reactive recommendations

Data Acquisition & Control
- Revenue-grade meter integration
  - Multi-meter support (grid, production, load monitoring)
- Real-time (30 sec granularity) data collection
- Inverter data collection inclusive of faults, alerting & setpoint control
- Transformer monitoring
- Recloser monitoring & control
- Weather station integration (irradiance, temperature, wind, pressure, rain)
- Combiner & string-level monitoring
- Digital In/Out control for any relay-controlled device such as:
  - E-Stop integration
  - Alarms
  - Sirens

Connectivity & Protocols
- TCP/IP
- Time Synchronization: NTP/PTP support for precise timestamp accuracy
- IEC 61850 Readiness: Future support for utility/SCADA integration
- MODBUS RS485 RTU/TCP
- DNP3
- Native SCADA integration-ready
- MQTT option for streaming data feeds
- Secure API & CSV ingestion

Platform & User Interface
- Secure Web-based dashboard accessible from desktop, tablet, or mobile
- HMI-style plant one-line visualization
- Portfolio-wide reporting and drilldown
- Configurable IFTTT-style notification engine
- Financial reporting with ROI/service call cost avoidance
- ERP integration (NetSuite, Acumatica, etc.)
- SLA impact tracking

SPECIFICATIONS

ELECTRICAL

INPUT VOLTAGE	100 – 277 VAC (single-phase)
INPUT CURRENT	2–5A typical (dependent on meter and add-ons)
FREQUENCY	50 / 60 Hz auto-sensing
UPS OPTIONS	Expandable to 100 hours runtime backup
UPS Options	Integrated MOV and TVS protection
ISOLATION	Galvanic isolation on communication port

MECHANICAL

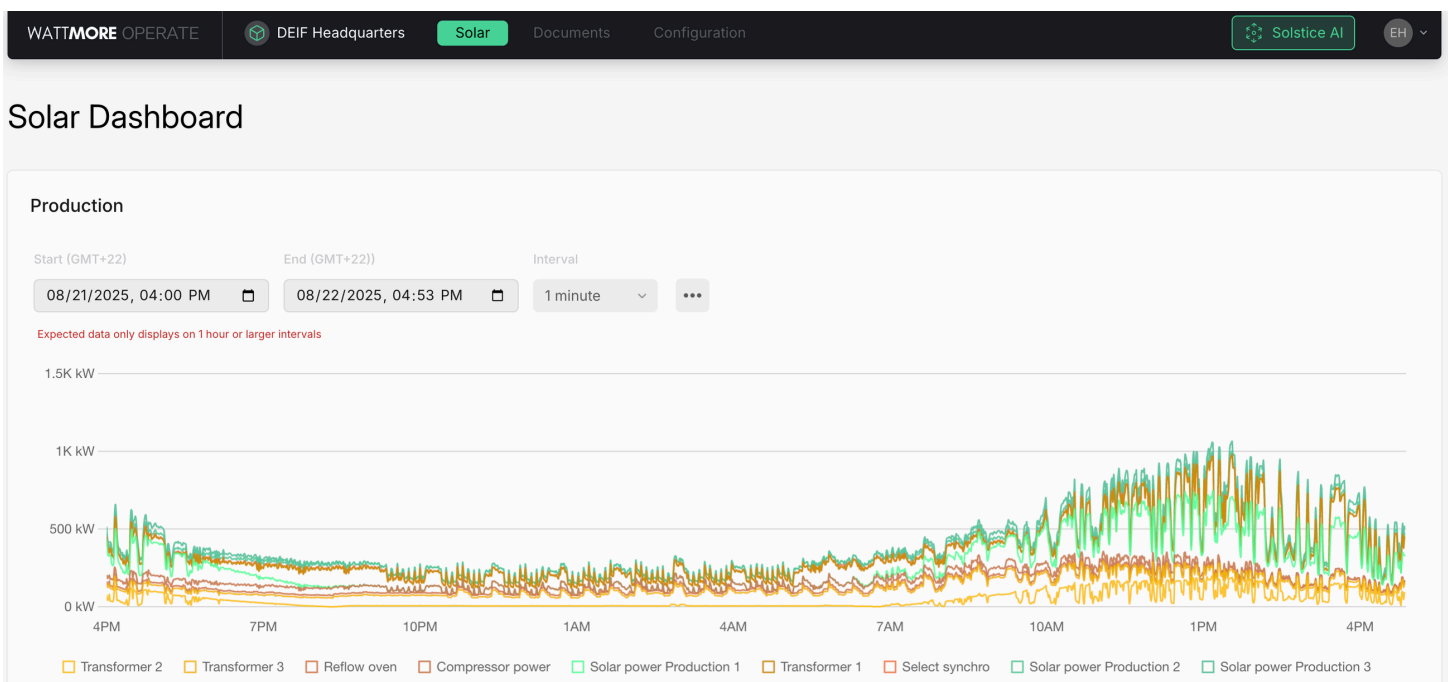|	
Enclosure	NEMA 4X, outdoor-rated, powder-coated steel Operating Temperature: -40 °C to +60 °C Humidity Tolerance: Up to 95% non-condensing Shock & Vibration: Designed to meet IEC/MIL-STD ruggedness standard
Dimensions	16" (H) × 16" (W) × 8" (D)
Ingress Protection	IP66 equivalent
Mounting	Wall or pole mount standard
Cooling	Passive convection; no moving parts
Weight	~28 lbs (base system, varies by options)

TLS 1.3 Encrypted Communication

- Zero Trust Architecture (ZTA): Principle of least privilege and continuous authentication
- Firmware Security: Secure boot and signed OTA firmware updates for edge device protection
- Incident Response & Recovery: Full logging, redundancy, and rollback for cyber recovery
- Regulatory References: FERC Order 2222 and IEEE 2030.5 (SEP2.0) roadmap alignment

All communication between EnForm Edge devices, the cloud (AWS), and the operate.wattmore.app interface is secured with TLS 1.3.

- **Mutual Authentication:** Edge devices and cloud servers utilize certificate-based mutual authentication to prevent unauthorized access or spoofing.
- **Role-Based Authentication (RBAC):** Multi-level role-based access controls restrict system functions by user type (e.g., Admin, Operator, Viewer).
- **Data Path Security**
  - Edge → AWS: Encrypted MQTT/HTTPS streams with signed payloads ensure no tampering during uplink.
  - AWS → operate.wattmore.app (User Interface): Web sessions are secured with TLS 1.3 and hardened session tokens.
  - operate.wattmore.app → AWS → Edge (Control Commands): All commands are validated against RBAC permissions, digitally signed, and transmitted over encrypted channels to prevent injection attacks.
- **Data Encryption at Rest:** All operational and historical data stored is encrypted at rest with AES-256.
- **Redundant Cloud Architecture:** Backend is deployed across multiple availability zones for resilience. Auto-scaling ensures uptime during high load.
- **Logging & Audit Trails:** Every command, config change, and data packet is logged with timestamped records for auditability and compliance.
- **Compliance Standards**
  - IEEE 1547: Interconnection compliance for DER (Distributed Energy Resources).
  - NERC-CIP Ready: Architecture designed with critical infrastructure protection in mind.
  - SOC 2 & ISO 27001 Alignment: Operational policies and cloud practices aligned with best-in-class information security standards.
- **Cybersecurity Monitoring:** Intrusion detection, anomaly detection (via Solstice AI), and AWS GuardDuty integration provide continuous security posture awareness.

UL 508A Panel compliance

ANSI C12.20 Accuracy Class for revenue-grade metering

FCC / CE compliance for communication equipment

SOFTWARE & REPORTING

Real-Time Analytics (import and export):

- Alarm & Event Management: Threshold-based alerts with configurable severity (warning vs critical)
- Forecasting: Integration with weather forecasting APIs for predictive performance
- Service Ticket Integration: Optional auto-ticketing into ServiceNow, Jira, or O&M platforms
- Configurable Data Granularity: Down to 1-second sampling (device dependent)
- Role-Based Dashboards: Tailored interfaces for field technicians, asset managers, and executives
- Offline Mode: Edge buffers and syncs data during connectivity outages, stores up to 180 days
- Portfolio Optimization: AI benchmarking and performance analysis across multiple sites

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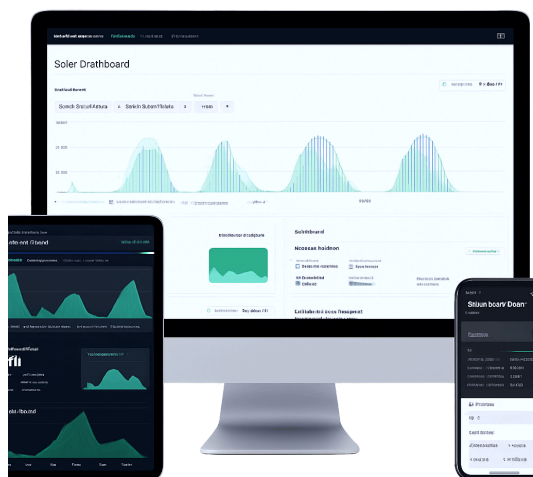
Intellect EnForm with Solstice AI is not just a DAS, but a full solar & storage operating system — enabling monitoring, control, reporting, and financial optimization in one cohesive platform.

APPLICATIONS

- Utility-scale PV plants
- C&I solar + storage systems
- Microgrids & off-grid islanded systems
- Community solar portfolios
- Hybrid PV + BESS installations

OPTIONAL ADD-ON MODULES

- Weather Station (GHI, DNI, DHI, wind speed, back-of-cell temp)
- Breaker/Contactor Monitoring modules
- Cybersecurity Appliance Add-On for advanced NERC compliance
- On-Prem Gateway Option for fully site-contained operation
- Cellular modem for redundant comms
- Expanded UPS battery backup pack
- Recloser contactor monitoring via SEL-651 integration
- Transformer monitoring
- Site surveillance integration
- Custom ERP connectors

FOR MORE INFORMATION VISIT WATTMORE.COM/INTELLECT-ENFORM