

ADVANTECH

Enabling an Intelligent Planet

Edge-EMS Builder

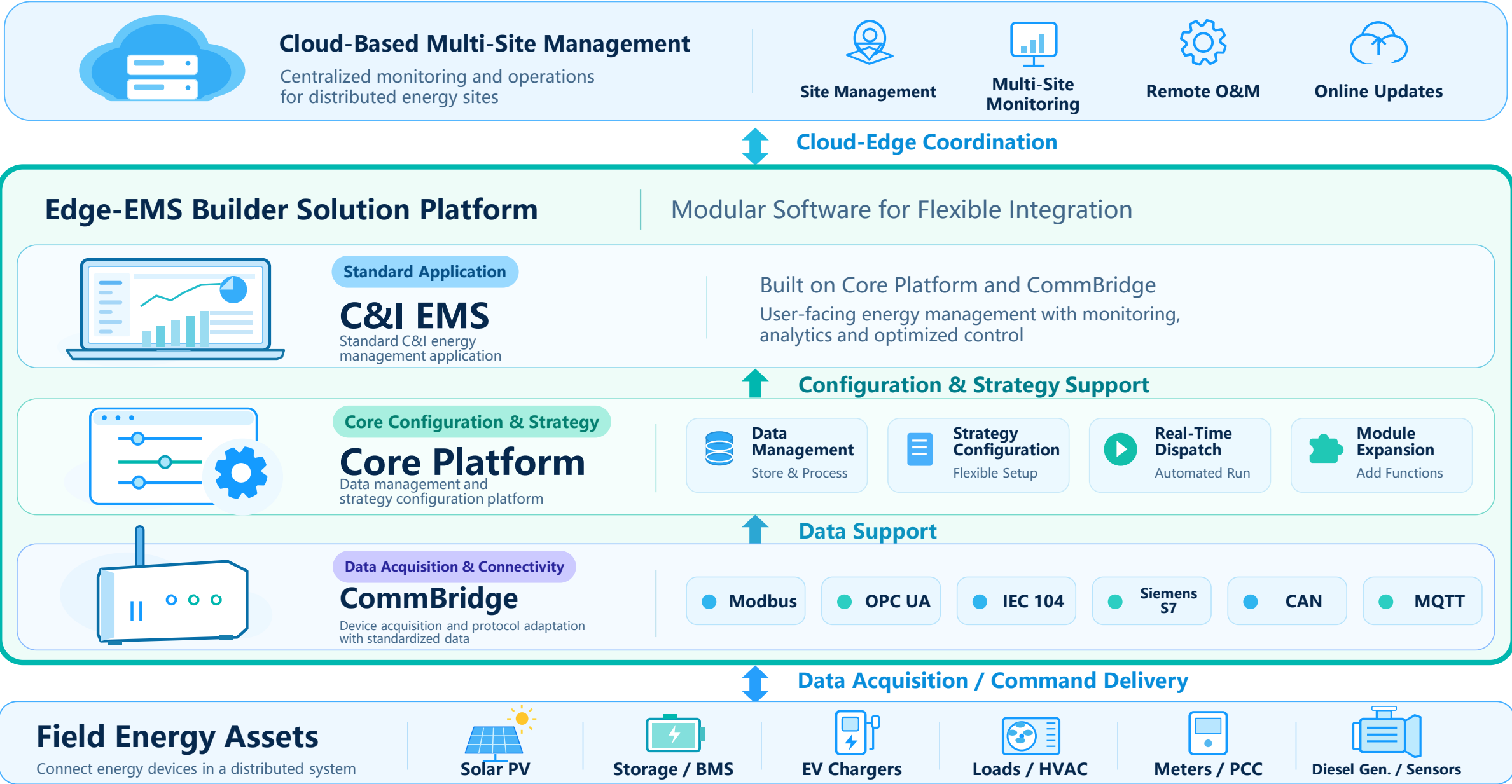
**An Open Configurable Energy Platform
to accelerate EMS Deployment**

Edge Computing &
AI-Powered WISE Solutions



Edge-EMS Builder: Flexible Solutions for Distributed Energy Management

Standard applications, core configuration and device connectivity for an integrated EMS



LINK: Device Connectivity and a Unified Data Foundation

Stabilize field data first, so future capabilities can be replicated.

LINK

Configurable

EVOLVE

Connect Energy Assets and Build a Reusable Data Foundation

Connect field devices, protocols, and data points through CommBridge, enabling monitoring, strategy control, and development on unified data.

Multi-Device Connection

PCS / BMS / Meter / PV / Diesel
Generator / Charger



Multi-Protocol Compatibility

Modbus / CAN / IEC104 /
MQTT / OCPP / OPCUA...

Data Standardization & Reuse

Convert data points, status,
alarms, power, and energy data
into standard models for EMS,
strategy control, and API calls.

Customer Value

Keep Existing Devices

Reduce Repeated
Adaptation Work

Unify Standard
Data Sources

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Configurable:Strategy Configuration and Open Integration

Turn connected data into a configurable, controllable, and extensible energy management system.



Configure Energy Strategies and Open System Orchestration

Based on data connected through Link, users can configure control strategies in Core Platform, integrate third-party EMS, and extend applications through APIs.

Strategy Orchestration

Configure charging/discharging, demand control, peak shaving, and other rules to control energy devices.

Third-Party Cloud Integration

Configure publish/subscribe data formats for two-way interaction with third-party EMS.

API & Front-End Extension

Open APIs for custom pages, business systems, and secondary development applications.



EVOLVE:Service Reuse and Rapid Expansion

Not rebuilding the system, but growing continuously on existing services.

LINK

Configurable

EVOLVE

Reuse Existing Services for Fast Expansion and Deployment

Build new capabilities on existing Xenova services and quickly deploy EMS services to new hardware platforms.

Service Capability Reuse

Reuse existing services for device access, strategies, alarms, data, and O&M.

Secondary Development

Extend new pages, strategies, reports, and scenarios on top of existing services.

One-Click Deployment

Quickly deploy EMS services to new edge hardware or project platforms.

Customer Value

Lower New Function
Development Cost

Shorten Hardware
Adaptation Cycle

Support Continuous
Expansion

Edge-EMS Builder Software Components

Real software products behind the Xenova Energy Orchestrator

Xenova Core Platform Open Platform Foundation

Xenova Core 触发管理 数据管理 告警管理 云边协同 协作管理 权限管理 系统配置 yongyin

数据名称: 请输入数据名称 Data Key: 请输入Data Key 分组Code: 请输入分组Code 搜索 重置 刷新

采集方案: 请输入采集方案 采集分组: 请输入采集分组 批量删除

原始数据ID	数据名称	数据别名	单位	Data Key	是否在CommBridge配置中	采集ID	采集方案	采集分组	最新值	操作
100241	电网侧瞬时C相有功功率	电网侧瞬时C相有功功率	瓦	电网侧瞬时C相有功功率	true	A1a15EgE49812	电网侧电表	电网侧电表...	0	Edit Delete
100240	电网侧瞬时B相有功功率	电网侧瞬时B相有功功率	瓦	电网侧瞬时B相有功功率	true	Dn6SueDYw10601	电网侧电表	电网侧电表...	0	Edit Delete
100239	电网侧瞬时A相有功功率	电网侧瞬时A相有功功率	瓦	电网侧瞬时A相有功功率	true	VhKHwDomQ19...	电网侧电表	电网侧电表...	0	Edit Delete
100238	电网侧瞬时总有功功率	电网侧瞬时总有功功率	瓦	电网侧瞬时总有功功率	true	wUfKZVJpD30766	电网侧电表	电网侧电表...	0	Edit Delete
100237	用户侧瞬时C相有功功率	用户侧瞬时C相有功功率	瓦	用户侧瞬时C相有功功率	true	qnK2VV7Z18404	用户侧电表	用户侧电表...	0	Edit Delete
100236	用户侧瞬时B相有功功率	用户侧瞬时B相有功功率	瓦	用户侧瞬时B相有功功率	true	QYd9ueiG010969	用户侧电表	用户侧电表...	0	Edit Delete
100235	用户侧瞬时A相有功功率	用户侧瞬时A相有功功率	瓦	用户侧瞬时A相有功功率	true	FuKRATVYX21211	用户侧电表	用户侧电表...	0	Edit Delete
100234	用户侧瞬时总有功功率	用户侧瞬时总有功功率	瓦	用户侧瞬时总有功功率	true	kOUBqaOhj13523	用户侧电表	用户侧电表...	0	Edit Delete
100233	用户侧电表1	用户侧电表分组1	瓦	用户侧电表1	false	0fc29671-708f-43...	用户侧电表	用户侧电表1	starte	Edit Delete
100232	田户侧电表	田户侧电表	瓦	田户侧电表	false	91f16c44-b42b-4...	田户侧电表	None	starte	Edit Delete

Platform tool for secondary development and capability accumulation

CommBridge Device Connectivity & Data Acquisition

WISE-DeviceOn aws 腾讯云 Azure 阿里云 华为云

组件列表: 采集组件, 处理组件, 上传组件, 通用组件

采集组件: 串行通信, Modbus客户端, OPCUA客户端

处理组件: 数据解析, 数据转换, 数据聚合

上传组件: MySQL数据库上传, MQTT上传, DeviceOn上传

通用组件: Modbus服务器, GPIO设备, SQLite数据库

数据流: 设备数据 -> 采集组件 -> 处理组件 -> 上传组件 -> 数据库/DeviceOn

Connectivity entry point for field devices into Xenova

Xenova C&I EMS Standard C&I EMS

XENOVA管理系统 yongyin.Wu@advantech.com.cn 最后更新时间: 2026/06/25 10:14:56

电站概况: 电池电量 SOC 86% 预计充/放电完成时间 24% 可用容量/总储能容量 0 kWh

电池状态: SOH 100% 累计放电功率 0 kWh 累计充电功率 0 kWh

自管设备: 三强设备 5 (23.81%) 产量 统计 21 12 (57.14%)

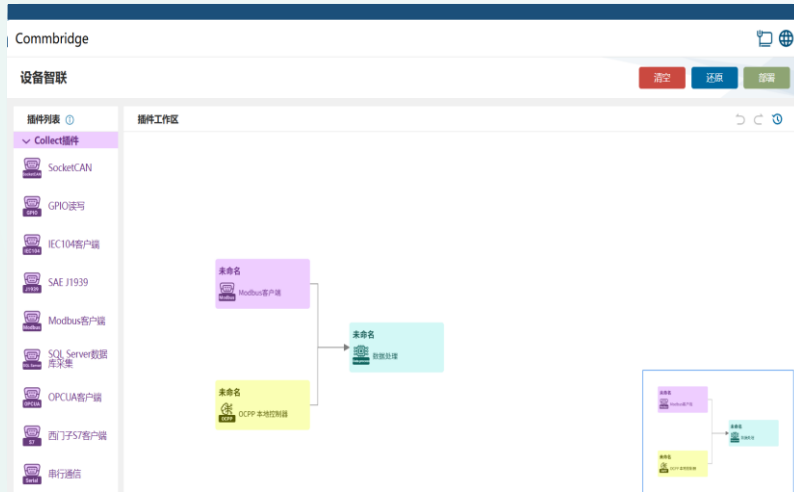
收益状况: 当前日收益 234 CNY 累计日收益 1000 CNY

主接线图: PV, Air Conditioner, Battery, DCDC, PCS, Transformer, Grid, STS, Light

累计放电功率: 2025/07, 2025/09, 2025/11, 2026/01, 2026/03, 2026/05

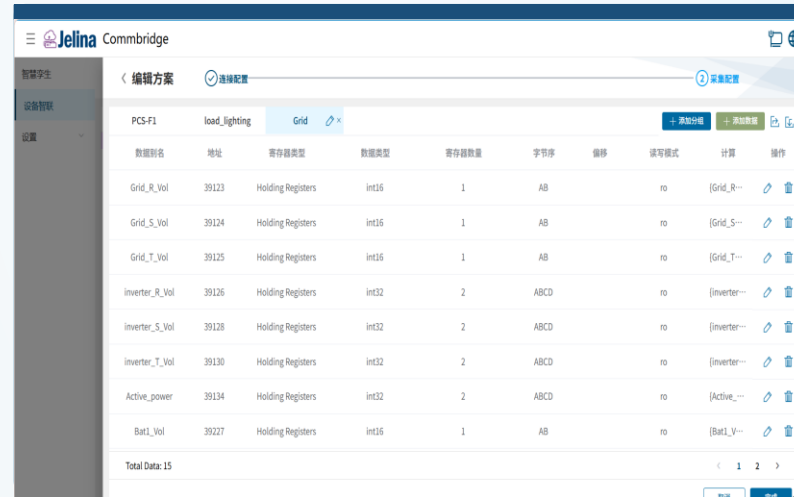
Standard EMS application interface visible to end users

CommBridge:Device Connectivity & Data Collection



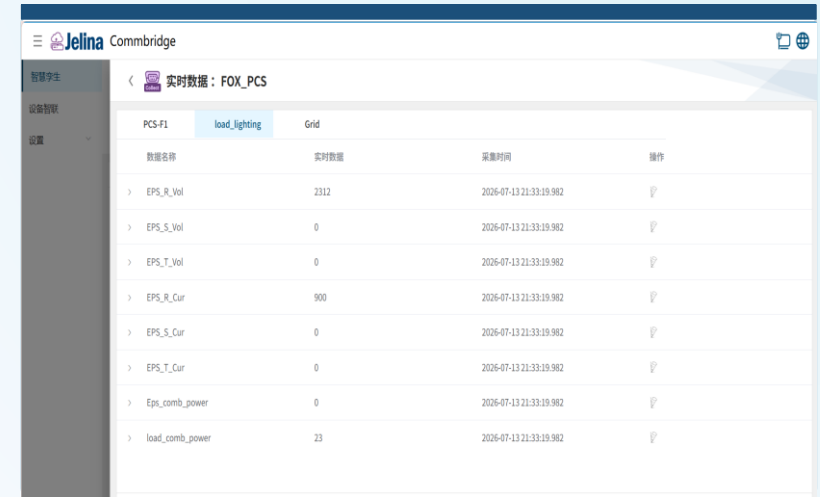
1. Protocol Plugin Matching

Select the right protocol plugin based on field device communication requirements.



2. Data Point Table Configuration

Configure device points, data types, and collection fields.



3. Data Collection and Upload

Collect real-time device data and upload it to Core Platform.

Connect devices, collect data, and take the first step toward energy digitalization.

数据名称

请输入数据名称

Data Key

请输入Data Key

分组ID

请输入分组ID Code

搜索

刷新

重置

采集方案

Fox

采集分组

请输入采集分组

批量删除

数据名称	单位	采集ID	采集方案	采集分组	最新数据	关联聚合数据	所属分组	上次采集时间	备注	操作
Grid_Vol		FFLeu6Jk302153	FOX_PCS	Grid	228.100000...	0	0	2026-07-13T22:50:59.321+...		编辑 删除
load_comb_power		XCd89V3Q71163	FOX_PCS	load_lighting	0.02300	0	0	2026-07-13T22:50:59.701+...		编辑 删除
Eps_comb_power		vMMd85Zx19891	FOX_PCS	load_lighting	0	0	0	2026-07-13T22:50:59.701+...		编辑 删除
EPS_T_Cur		oJMUuRgP15903	FOX_PCS	load_lighting	0	0	0	2026-07-13T22:50:59.701+...		编辑 删除
EPS_S_Cur		Br0Jk9j19532	FOX_PCS	load_lighting	0	0	0	2026-07-13T22:50:59.701+...		编辑 删除
EPS_R_Cur		cBcHsKcn33490	FOX_PCS	load_lighting	0.900000	0	0	2026-07-13T22:50:59.701+...		编辑 删除
EPS_T_Vol		gLUr188Wfm15900	FOX_PCS	load_lighting	0	0	0	2026-07-13T22:50:59.701+...		编辑 删除
EPS_S_Vol		ESR0qVUf21078	FOX_PCS	load_lighting	0	0	0	2026-07-13T22:50:59.701+...		编辑 删除
EPS_R_Vol		84C8abnE28206	FOX_PCS	load_lighting	230.200000...	0	0	2026-07-13T22:50:59.701+...		编辑 删除
PV_total_power_today		LwqU9rC329053	FOX_PCS	PCS-F1	0	0	0	2026-07-13T22:50:59.965+...		编辑 删除
PV_total_power		0tuBM96OK13810	FOX_PCS	PCS-F1	0	0	0	2026-07-13T22:50:59.965+...		编辑 删除
PV2_cur		eugxjTDA718714	FOX_PCS	PCS-F1	0	0	0	2026-07-13T22:50:59.965+...		编辑 删除

数据管理 / 原始数据

Total Data 38

1

2

3

...

前往

2

1

Manage collected data, aggregated data, time-based data, and historical data.

AEMS 故障管理 数据管理 报警管理 报警记录

故障检测

故障列表

故障ID	故障名称	事件逻辑	备注
100000	故障检测	AND	

内部故障列表

```

1  -- 内部故障列表
2  local _local_fault_map = {
3      ["输出过流故障"] = $[输出过流故障],
4      ["直流母线过压故障"] = $[直流母线过压故障],
5      ["交流分断器开故障"] = $[交流分断器开故障],
6      ["模块过流故障"] = $[模块过流故障],
7      ["柜内过流故障"] = $[柜内过流故障],
8      ["输出过流故障"] = $[输出过流故障],
9      ["开闭锁器卡合故障"] = $[开闭锁器卡合故障],
10     ["开闭锁器卡分故障"] = $[开闭锁器卡分故障],
11     ["直流母线欠压故障"] = $[直流母线欠压故障],
12     ["柜内欠压故障"] = $[柜内欠压故障],
13     ["柜内风温故障"] = $[柜内风温故障],
14     ["柜外风温故障"] = $[柜外风温故障],
15     ["新空载过流故障"] = $[新空载过流故障],
16     ["交流滤波电容过流故障"] = $[交流滤波电容过流故障]
17 }
18
19 -- 外部故障列表
20 local _external_fault_map = {
21     ["直流母线欠压故障"] = $[直流母线欠压故障],
22     ["直流母线反接故障"] = $[直流母线反接故障],
23     ["柜内温度过大故障"] = $[柜内温度过大故障],
24     ["电网过压故障"] = $[电网过压故障],
25     ["电网欠压故障"] = $[电网欠压故障],
26     ["电网过流故障"] = $[电网过流故障],
27     ["电网欠流故障"] = $[电网欠流故障],
28     ["交流防雷故障"] = $[交流防雷故障],
29     ["直流防雷故障"] = $[直流防雷故障]
30 }

```

```

1  * 内部故障控制
2
3  local body_fault_map = {
4      "输出过流故障" = $1输出过流故障,
5      "直流过压故障" = $1直流过压故障,
6      "直流分断失败故障" = $1直流分断失败故障,
7      "模块过流故障" = $1模块过流故障,
8      "柜内过流故障" = $1柜内过流故障,
9      "输出过流故障" = $1输出过流故障,
10     "并网侧电容器过流故障" = $1并网侧电容器过流故障,
11     "并网侧电抗器过流故障" = $1并网侧电抗器过流故障,
12     "逆变器内部故障" = $1逆变器内部故障,
13     "柜内风机故障" = $1柜内风机故障,
14     "柜外风机故障" = $1柜外风机故障,
15     "新发模块过流故障" = $1新发模块过流故障,
16     "交流滤波电容过流故障" = $1交流滤波电容过流故障
17 }
18
19 * 外部故障控制
20
21 local external_fault_map = {
22     "组网反充电故障" = $1组网反充电故障,
23     "组网反充电故障" = $1组网反充电故障,
24     "柜内温度过大故障" = $1柜内温度过大故障,
25     "电网过压故障" = $1电网过压故障,
26     "电网欠压故障" = $1电网欠压故障,
27     "电网过流故障" = $1电网过流故障,
28     "电网欠流故障" = $1电网欠流故障,
29     "交流频率故障" = $1交流频率故障,
30     "直流频率故障" = $1直流频率故障
31 }

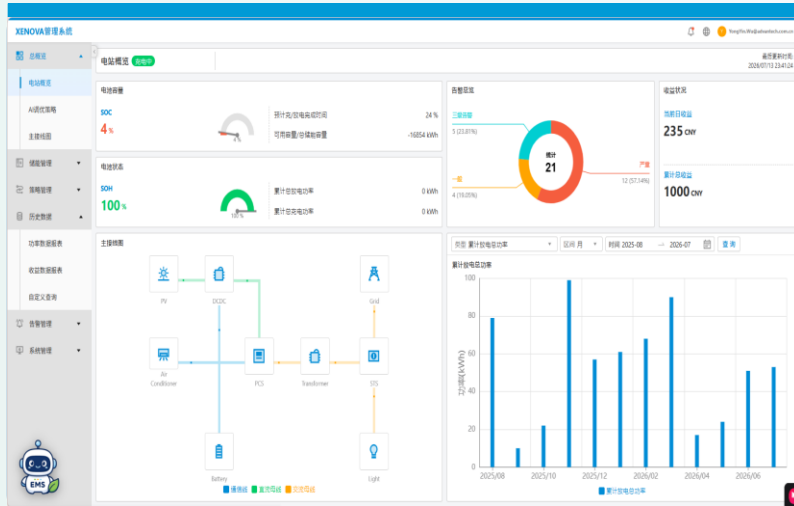
```

The screenshot shows the AEMS web interface for publishing a message. The top navigation bar includes 'AEMS' and '触发电压' (Trigger Voltage). The main content area is titled '编辑发布消息' (Edit Publish Message). On the left, there is a sidebar with navigation links: '订阅配置' (Subscription Configuration), '发布消息' (Publish Message), '订阅配置列表' (Subscription Configuration List), and '发布内容' (Publish Content). The '发布消息' link is active. The main content area contains a form for publishing a message. At the top, there is a '订阅配置列表' (Subscription Configuration List) table with columns: '订阅配置ID' (Subscription Configuration ID), '订阅配置名称' (Subscription Configuration Name), '状态' (Status), 'Topic', 'QOS', and '动作' (Action). The table has two rows: one with '100000' and 'Subscription...' and another with '100002' and '订阅测试'. Below the table, there is a '发布内容' (Publish Content) section with a text area for the message content. The text area contains the message: '***发布消息***'.

Connect with third-party cloud platforms and EMS through open interfaces or MQTT.

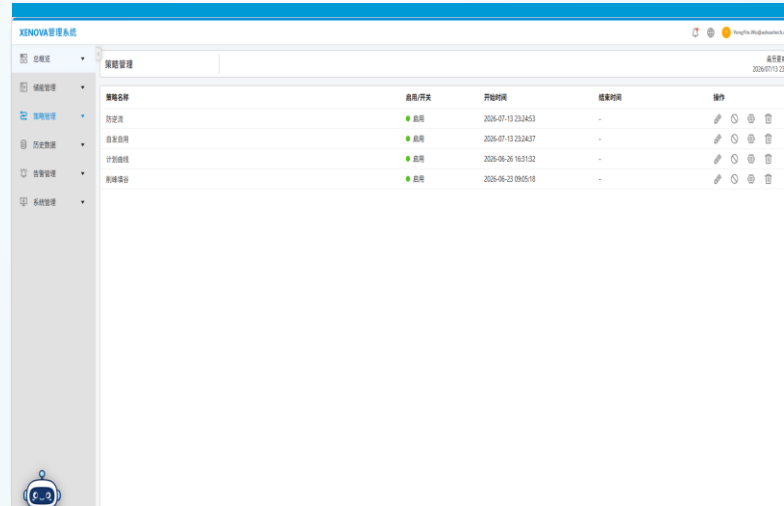
ADVANTECH

C&I EMS: Standard Commercial & Industrial EMS



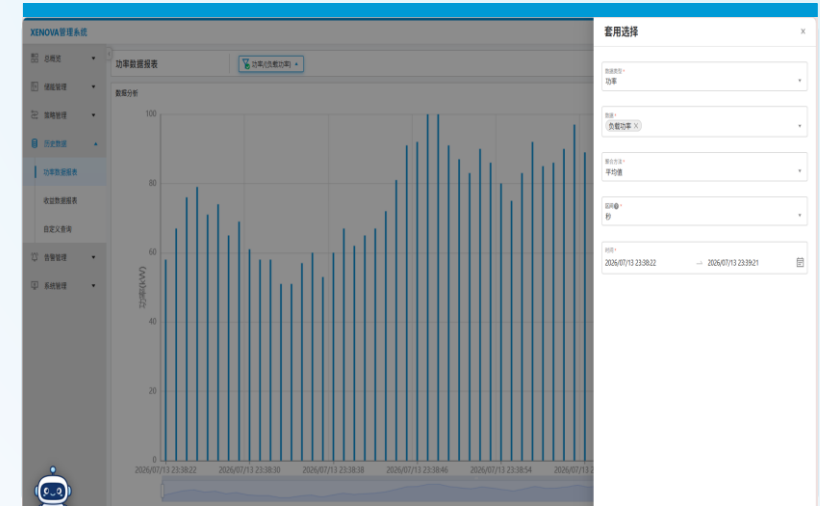
1. Business Data Monitoring

Monitor site operation status, key business data, and energy system performance.



2. Basic Strategy Applications

Support plan curves, peak shaving, and reverse power prevention.



3. Historical Data Analysis

Query and analyze historical data for revenue review, issue tracking, and O&M decisions.

Make energy storage systems visible, manageable, and effective.

C&I EMS Solution: Strategy Packages for Different Goals

Strategy add-on packages for standard operation, revenue optimization and advanced orchestration

Strategy Value Ladder

From standard configuration, to revenue tuning, to multi-device orchestration

Standard Operation Pack

For standard C&I ESS operation, mainly based on parameter configuration and reusable rule templates.

Self-consumption

Backup power

Schedule Curve

Revenue Optimization Pack

For economic operation, requiring project-specific tuning based on load, tariff, SOC and operation limits.

Peak shaving

Demand control

PV consumption

Advanced Orchestration Pack

For multi-energy, multi-device and multi-mode coordination, usually requiring scenario validation.

PV-ESS-Diesel coordination

PV-ESS-EV coordination

Microgrid master-slave control

1 package = 1 deliverable configuration package for 1 clear strategy objective

Edge-EMS Builder Hardware & Software Product Matrix

A shared software foundation for cabinet, site and other edge deployments across different hardware platforms

AFE-E620 Cabinet Edge Controller (EMU)  • PCS, BMS and auxiliary device connectivity • Cabinet-level data standardization and safety interlocks • Local caching and standard northbound interfaces Unified Cabinet Connectivity, Lower Integration Costs	AFE-E630 Standard Site Controller (EMS)  • Data aggregation across cabinets and site devices • Site-level strategy execution and local autonomy • Cloud-based remote operations and maintenance Unified Site Management, Cloud-Edge Collaboration	AFE-R770 High-Performance x86 Site Controller  • x86 platform for complex strategies and local data processing • Industrial interfaces for device and peripheral expansion • Large sites, complex projects and deep customization High-Performance Expansion, Complex Application Integration
Shared Software & Service Foundation WEDA-Ready Linux Edge-EMS Builder		

Typical Site Configuration

AFE-E630 × 1

+

AFE-E620 × N

+

WEDA/AIM-Linux Cloud

Edge-EMS Builder in Real-World Energy Projects

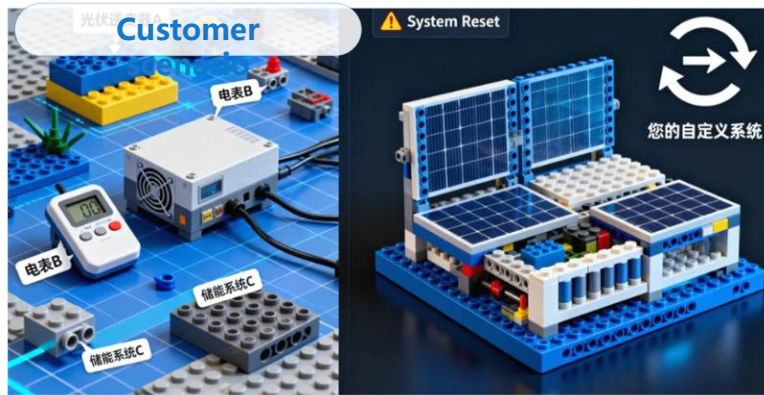
From platform capability to repeatable customer value

FEATURED CASE

ESS System Integrator

From Device Integration to Energy Orchestration

Platform delivery proof in a complex C&I energy storage project



Problem

Limited self-extension capability

New devices or energy strategies often required vendor-side redevelopment, slowing replication and increasing engineering cost.

Xenova Capability

Platform Configuration + Replicable Delivery

Configurable data, strategy and operation capabilities turn one-off delivery into reusable platform assets.

Value Delivered

Extend, evolve and replicate

Customers can expand strategies, add devices without rebuilding the system, and improve delivery efficiency across follow-on projects.

Additional Proven Scenarios

Mobile ESS Charging Vehicle



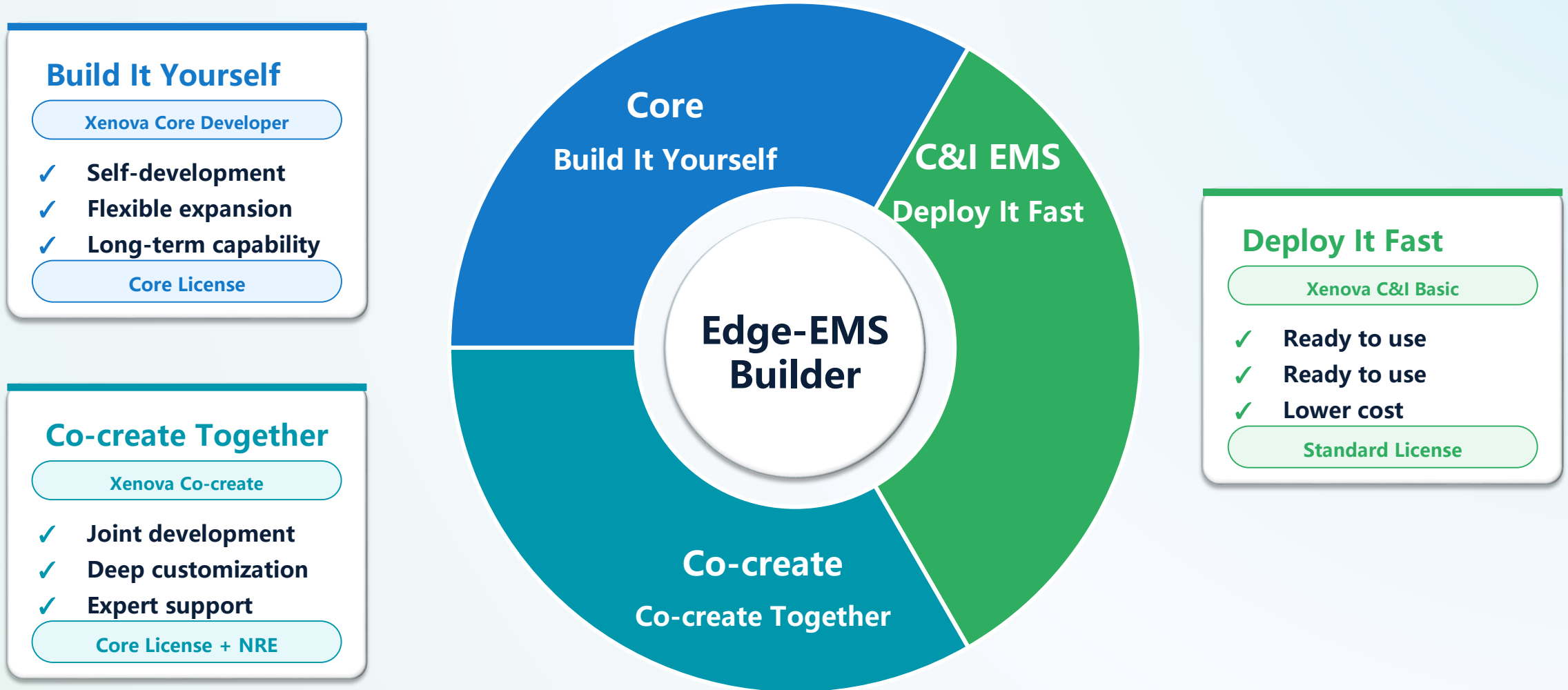
Plug-and-deploy for emergency charging, temporary backup and flexible mobile deployment

Campus Energy Operation



Improve multi-energy coordination and support unified campus energy dispatch.

Choose Your Way to Success



Build your own → Core | Launch fast → C&I | Complex projects → Co-create

Edge-EMS Builder Service Models

Match service models by customer capability and project requests

Platform

Build

Xenova Core Developer Package

Target Customers

Customers with software capability, system integrators, device manufacturers, and in-house EMS teams

Positioning

An open energy platform foundation for partners to build their own EMS capabilities

Service Scope

- Platform configuration & open interfaces
- Protocol integration & data services
- Strategy configuration & secondary development
- Developer docs & remote technical support

Customer Value

Reduce EMS development barriers and help partners build platform-based energy management capabilities.

Solution

Deploy

Xenova C&I Standard Package

Target Customers

C&I ESS projects, EPCs, system integrators, and standardized project customers

Positioning

A standard EMS solution package for commercial and industrial energy storage scenarios

Service Scope

- Standard EMS functions & project configuration
- Device monitoring, alarms & data acquisition
- Basic operation strategy templates
- Remote commissioning & delivery support

Customer Value

Shorten C&I ESS project delivery cycles and reduce engineering costs.

Co-create

Scale

Xenova Co-Creation Package

Target Customers

Special scenarios, platform customers, strategic accounts, and complex energy system projects

Positioning

A joint customization and co-development model for complex energy scenarios

Service Scope

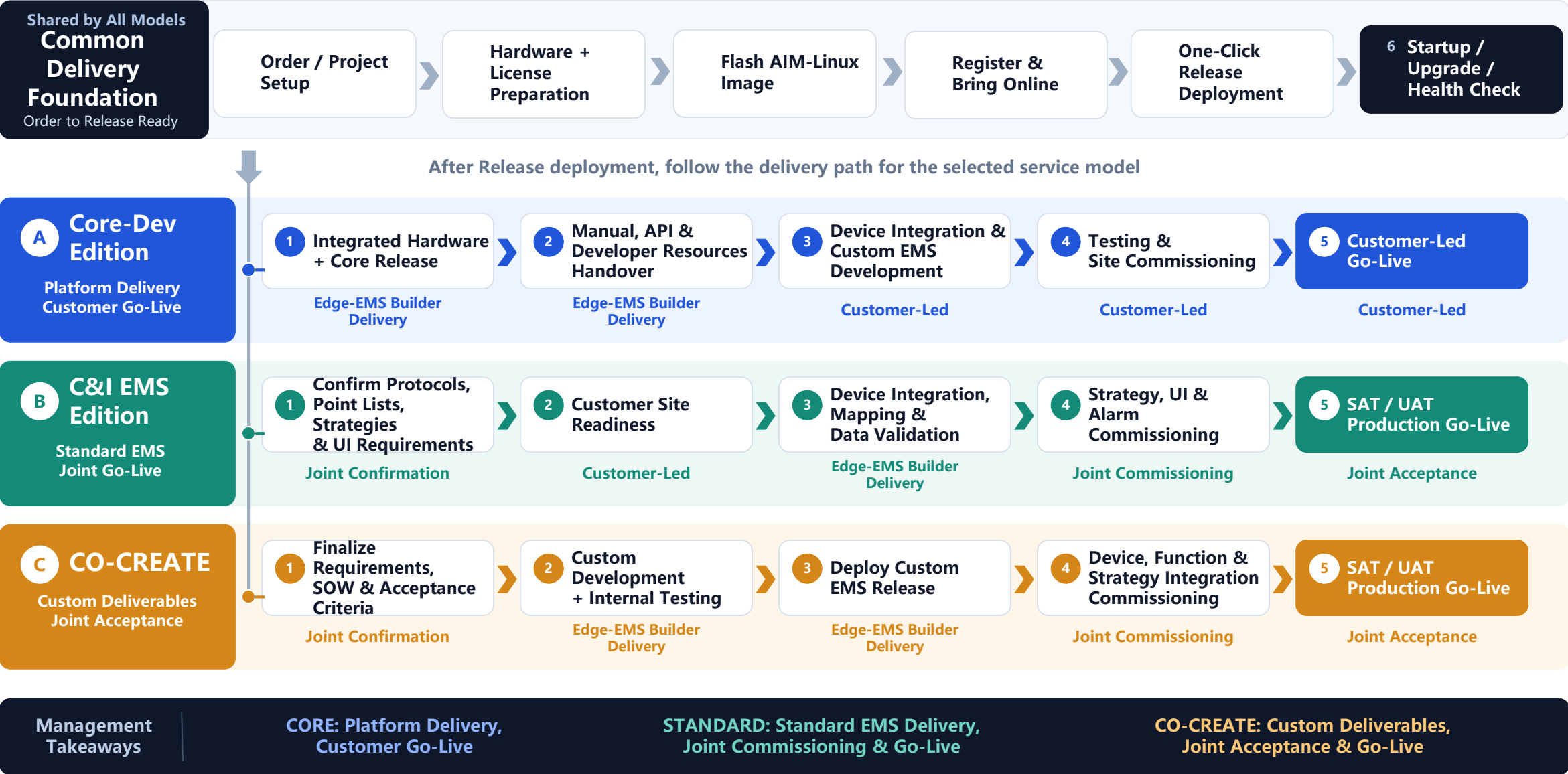
- Special protocol & device adaptation
- Customized strategy & business logic development
- End-to-end third-party system integration
- End-to-end testing, validation & delivery support

Customer Value

Support differentiated needs and convert customization experience into reusable platform capabilities.

From Order to Go-Live: Three Service Delivery Paths

Shared hardware and software delivery. Development, commissioning and go-live responsibilities vary after Release deployment.



ADVANTECH

Enabling an Intelligent Planet

Edge Computing & AI-Powered WISE Solutions



研华嵌入式公众号



研华嵌入式视频号