

## FLUENCE OS

# Bringing unparalleled visibility and control to your storage system

The 6<sup>th</sup> Generation Fluence Operating System (OS) is a fully integrated operations platform that combines comprehensive controls, asset management, and system visibility at a single site or across an entire fleet.

Manage storage system operations according to pre-set modes and access real-time information through multiple system views, and interfaces.

## Fluence OS Features



### SYSTEM CONTROLS

Actively manage power and operational modes at the Array, Core, and Node levels with easy access to system KPIs.



### APPLICATION STACKING

Increase revenue generating opportunity by stacking multiple dispatch applications on top of each other.



### REAL-TIME ALARMS

Alarms proactively notify operators to system issues and anomalies with time-stamped details.



### APPLICATION SCHEDULING

Schedule multiple market dispatch applications with all relevant timing and operating parameters.



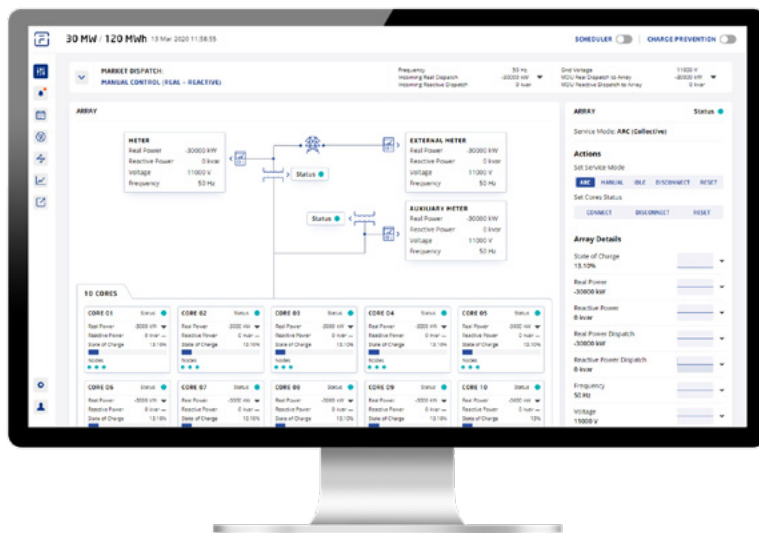
### CHARGE PREVENTION

Prevent charging during select days and hours to avoid peak pricing or comply with network requirements.



### EMBEDDED SAFETY

Fluence OS continuously monitors, detects, and alerts operators to potential anomalies in the system.



Comprehensive data collection at every level of the storage system provides real-time insights and enables 24/7 remote monitoring and support.

## Fluence OS Monitoring

### DATA RETENTION

30,000+ data points are collected for a typical 20 MW system. Data is retained locally on-site and regularly backed up to the cloud per project requirements.

### SYSTEM LIMIT ANALYSIS

A range of system limits, including cell, BMS and PCS voltage, temperature, SOC, SOH, humidity and more, are continuously analyzed to ensure safe operation.

### REMOTE MONITORING

All systems are built with 24/7 remote monitoring and control capabilities to detect potential issues before they occur and alert operators for immediate action.

# Controls Architecture

The Fluence OS architecture uses embedded logic and application rules to turn outside market signals into efficiently dispatched power.

## MARKET DISPATCH UNIT (MDU)

The Market Dispatch Unit dispatches real and reactive power to the Array controller as generated by the active applications.

## ARRAY CONTROLLER

The Array Controller presents the storage Array as a single battery to the MDU; aggregating all Cores in the system. Dispatch signals sent from the MDU are distributed to the Cores.

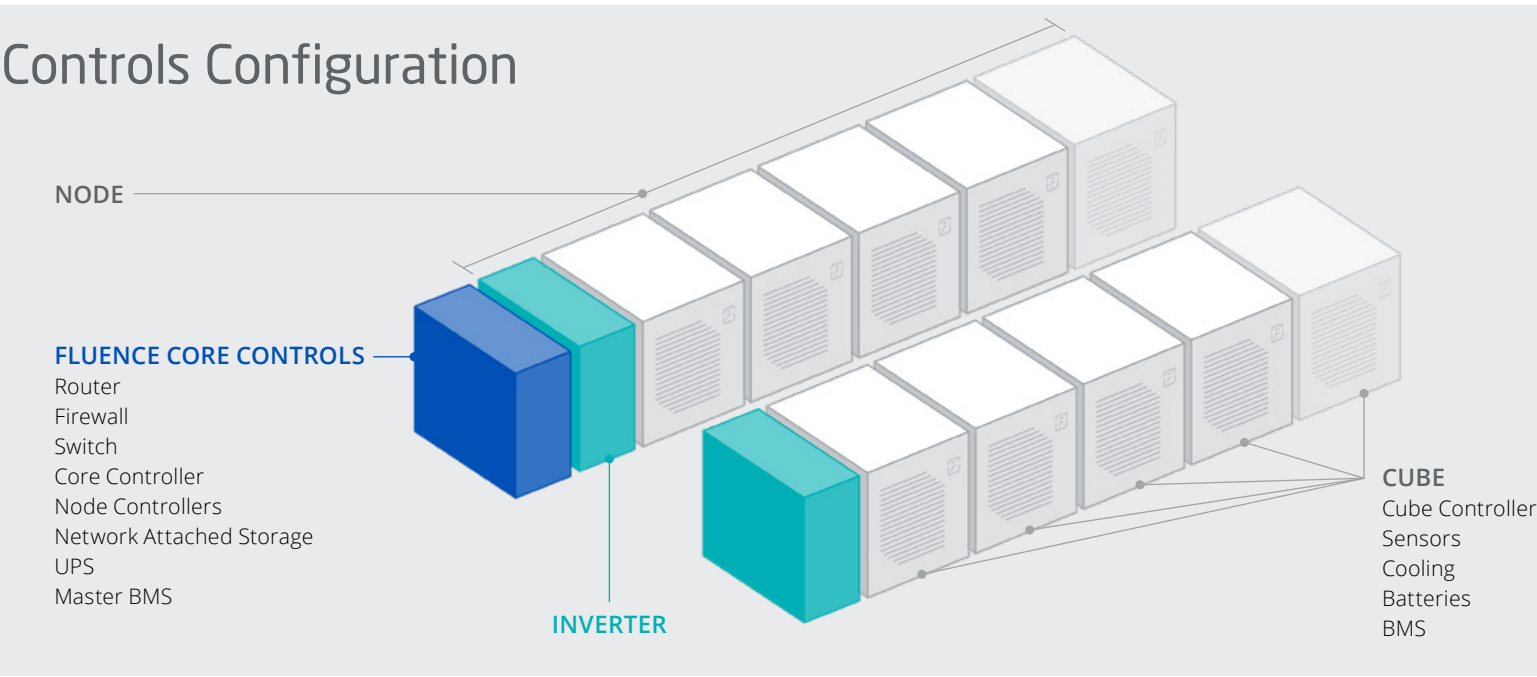
## CORE CONTROLLER

The Core Controller aggregates Nodes from the isolation transformer down, present/ command collection of Nodes. Dispatch signals sent from Array are distributed to the Nodes.

## NODE CONTROLLER

The Node Controller directly connects to each PCS, BSC/BMS/Batteries system.

# Controls Configuration



# Controls Specifications

## NETWORK AND CYBER SECURITY

VPN-based remote site access
Multifactor authentication
High grade, 256-bit encryption
Enterprise-class network security
Weekly vulnerability scanning
Data transfer over secure VPN tunnels

## SYSTEM DATA POINTS

2,000 points collected per Array*
3,000 points collected per Core*

## SOFTWARE USER ROLES

Observer
Operator
Lead Operator
Administrator

## RTU PROTOCOLS

Modbus
DNP3
IEC 60870-5-104

## SERVICE MODES

Automatic Resource Control (ARC)
Manual
Idle
Disconnect
Reset

## DISPATCH APPLICATIONS

Power Factor Regulation
Voltage Regulation
Primary Frequency Control
Secondary Frequency Control
Peak Shaving
Primary Fast Frequency Response
Non-Spinning Reserve
Renewable Firming
Dynamic VAR Support

\* Approximate, varies by system configuration

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