



BROCHURE

# Electrical System Integration (eSI)

## Solutions for power and automation integration

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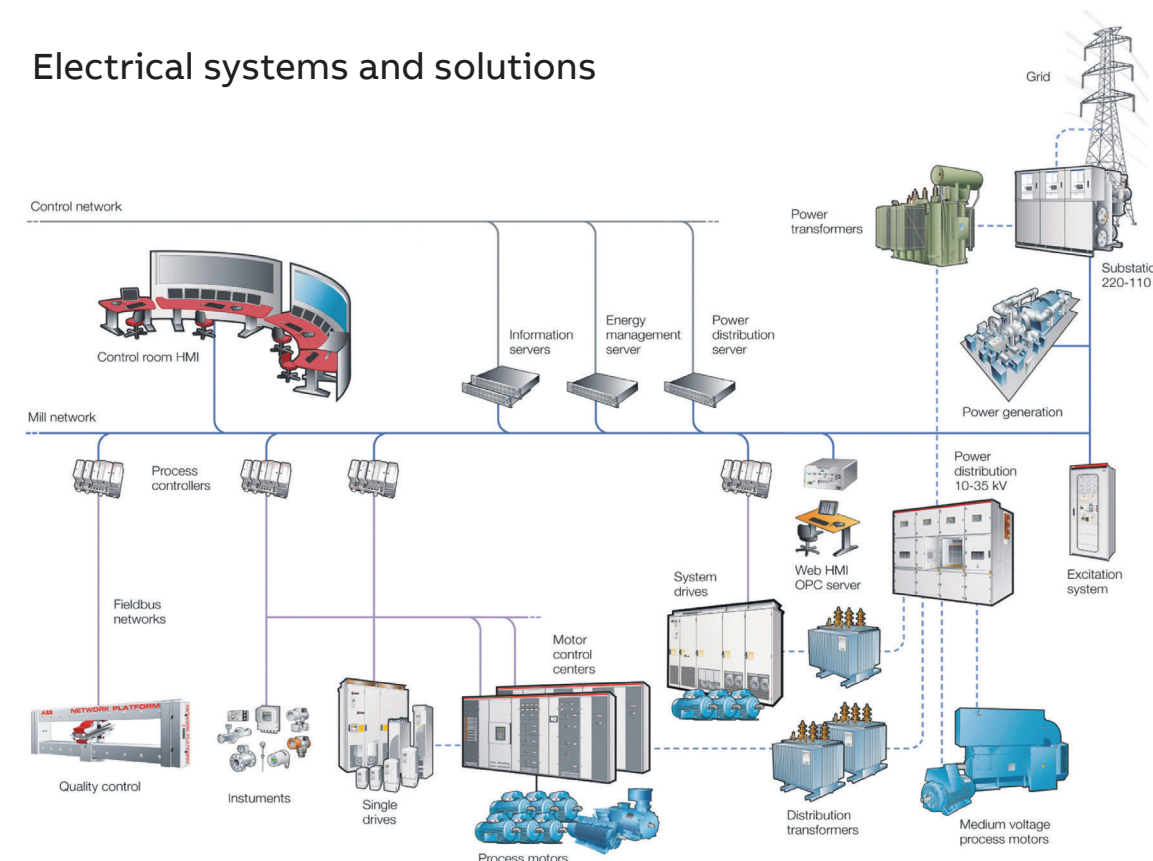


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**electrical System Integration (eSI)**  
 is backed by ABB's leading  
 technology, global application  
 knowledge and experienced  
 support network, delivering  
 cutting-edge solutions to various  
 industries including Chemical, Oil &  
 Gas, Power, Utility, Key  
 Infrastructure, Renewables and  
 Data Centers.

## Electrical System Integration (eSI)

Complete confidence of system reliability

### Electrical systems and solutions



#### A global trend

Industry depends on energy. Availability of scarce resources, the volatility of energy costs, growing environmental concerns and more stringent legislation are just a few of the factors driving a global push towards improved energy management.

Reliable and efficient power monitoring and control are crucial to the success of energy-intensive industries such as semiconductor, pharmaceutical, oil & gas, petrochemical and mining operations.

Electrical equipment ranging from high to medium and low voltage requires real-time data acquisition on the status of various electrical equipment and plant electrical networks to operate efficiently and safely, and to facilitate maintenance.

#### eSI - A tailored solution

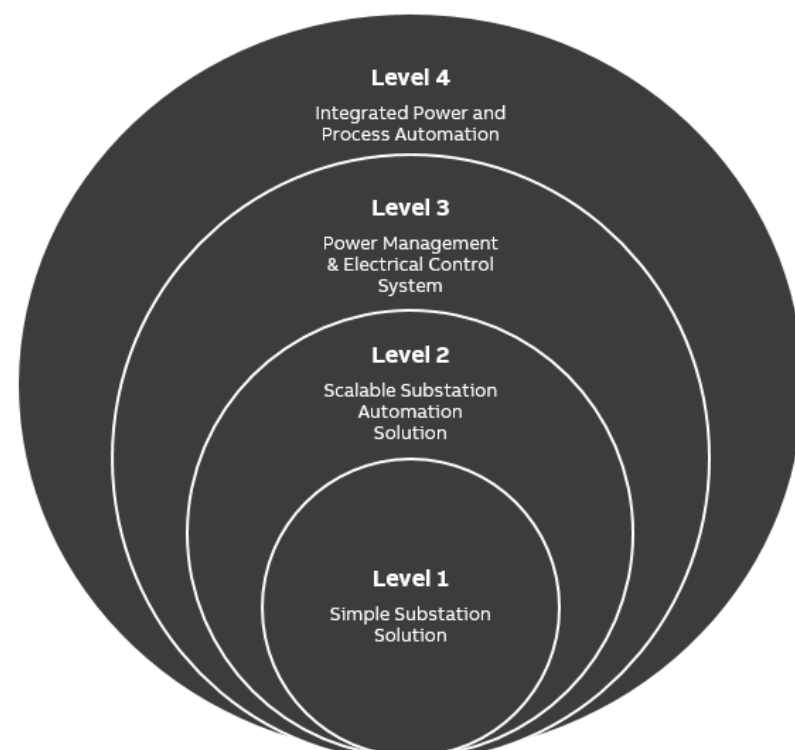
ABB answers our customers' need for improved energy management with electrical System Integration (eSI).

This solution leverages and maximizes ABB's portfolio of power systems for all voltage levels (low-, medium-, high-voltage), providing robust power monitoring and control:

- Consolidated control and distribution of all information from all electrical equipment in a plant regardless of supplier.
- Integration of electrical equipment from different suppliers with different design specifications and functionalities.
- Control in the event of unstable power supply from grid or disruption of power supply in plant that may lead to blackouts and costly, unplanned shutdowns.



## Four levels of applications



### Level 1

An entry level application for simple distribution substation automation which uses COM600 as an all-in-one communication gateway, automation platform and user interface solution for utility and industrial distribution substations.

### Level 3

The third level application typically entails PLC-based Electrical Control System (ECS) which includes functionalities of Level 1, Level 2 and Power Management System (PMS) based on ABB's flagship automation platform - System 800xA.

It targets prevention of blackouts, especially in plants with in-house generation, critical loads or unstable supply from the power grid.

### Level 2

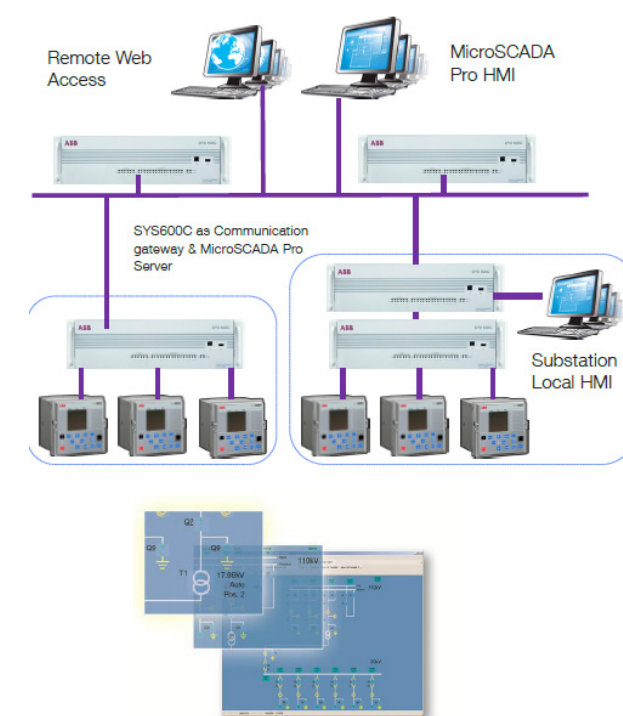
Level 2 is suitable for both transmission and distribution substations level applications. The ABB's MicroSCADA product provides the crucial SCADA function while allowing the connectivity to the higher systems such as Distributed Control System (DCS).

### Level 4

The fourth level application combines both the DCS and ECS on the same System 800xA platform to achieve complete coordination and integration of process and electrical system.

With Integrated Process and Power Automation, ABB's System 800xA provides full plant integration.

## All-in-one communication gateway and SCADA



### Level 1- All-in-one communication gateway, COM600

COM600 is the ideal solution for simple distribution and substation automation. Supplied with a programmable logic processor, COM600 is a flexible implementation platform for processing substation-level automation tasks with data historian, alarms and events management functionalities.

As a user interface solution, COM600 accommodates web technology-based functionalities, providing access to substation devices and processes via a web browser-based Human Machine Interface (HMI).

It can be used for ABB low-voltage and medium-voltage switchgear or motor control center (MCC), connecting them to higher systems such as SCADA or asset management systems.

COM600 provides connectivity between substation IEDs and network-level control and management systems.

### Level 2 - SCADA

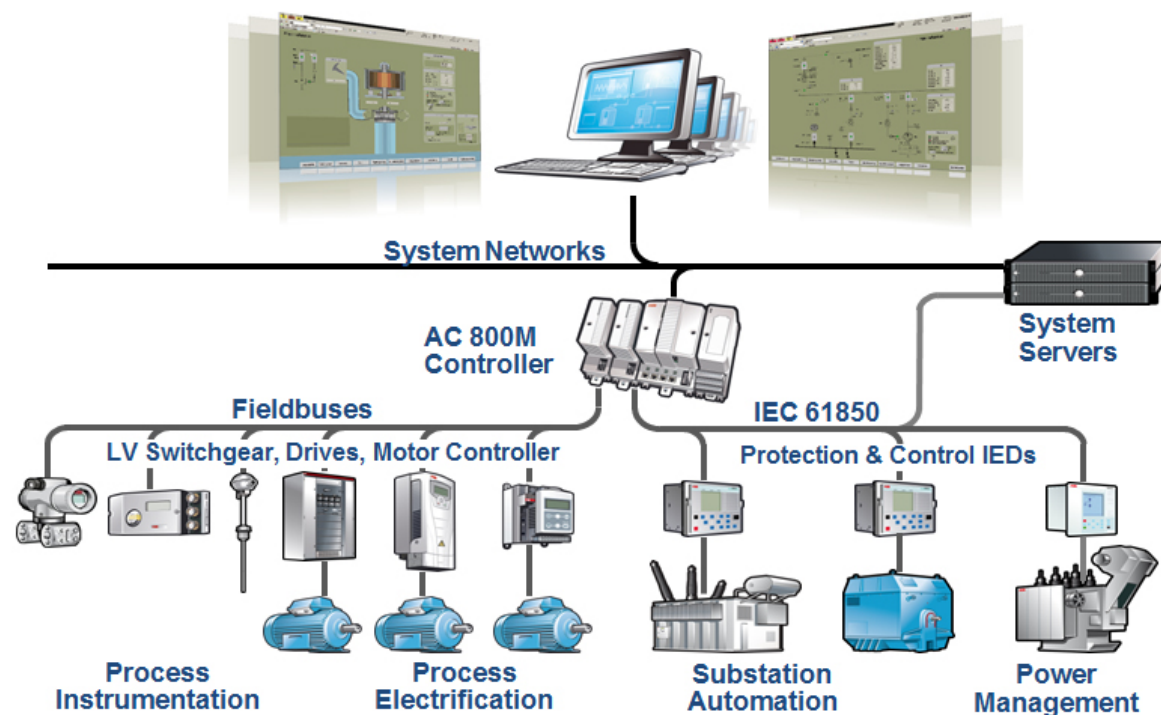
Suitable for both transmission and distribution substation level applications, ABB's MicroSCADA provides crucial SCADA functions while allowing the connectivity to higher-level systems such as Distributed Control Systems (DCS).

#### MicroSCADA Pro:

- Provides a versatile and scalable solution from communication gateway applications to monitoring and control system applications with Control System HMI.
- Includes all the functionalities required for real-time monitoring and control of primary and secondary equipment in transmission and distribution substations, as well as plant power distribution.
- MicroSCADA Pro ensures optimized control and reliable operation of the switchyard through seamless integration and connectivity between different devices and systems.
- It also communicates with the plant's control system to ensure that all necessary information about the power distribution process is available for the process control system operators.



## PMS and full plant integration



### Level 3 – Power management system

The third level application typically entails PLC-based Electrical Control System (ECS) which includes the functionalities of Level 1 (COM600), Level 2 (SCADA) and Power Management System (PMS) based on ABB's flagship automation platform - System 800xA.

ABB's PMS targets prevention of blackouts, especially in plants with in-house generation, critical loads or unstable supply from the power grid. The system offers:

- Loadshedding control, including fast, under-frequency and overload.
- Generator control, including integration with governor and excitation controller.
- Transformer control, including tap changer control.
- Circuit breaker control, including integration with protection.
- Motor control, including integration with motor control centers.
- Power control, including peak shaving and load sharing.
- Manual and automatic synchronization and monitoring.

### Level 4 - Full plant integration with system 800xA

Finally, combining both DCS and ECS on the same 800xA System platform achieves complete coordination and integration of the process and electrical systems.

With Integrated Process and Power Automation, ABB's System 800xA provides the highest level of plant integration. System 800xA's complete integration capabilities help to create a single automation environment that unifies the control of process-related equipment as well as protection, control and monitoring of substation equipment and power transmission and distribution.

Integrating the process automation system with the power automation system permits a single strategy for engineering, operations and maintenance.

Whether generating power or consuming it, the economic benefits of electrical integration can run into millions of dollars gained in increased production or saved in reduced operating costs.

ABB Singapore is the Center of Excellence for eSI business globally, providing value-add solutions in Electrical Control Systems and Power Management System around the world.

