



ELECTRICAL AUTOMATION SYSTEM



LARSEN & TOUBRO

Larsen & Toubro (L&T) is India's leading engineering construction & manufacturing organization, a technology - driven company that infuses engineering with imagination.

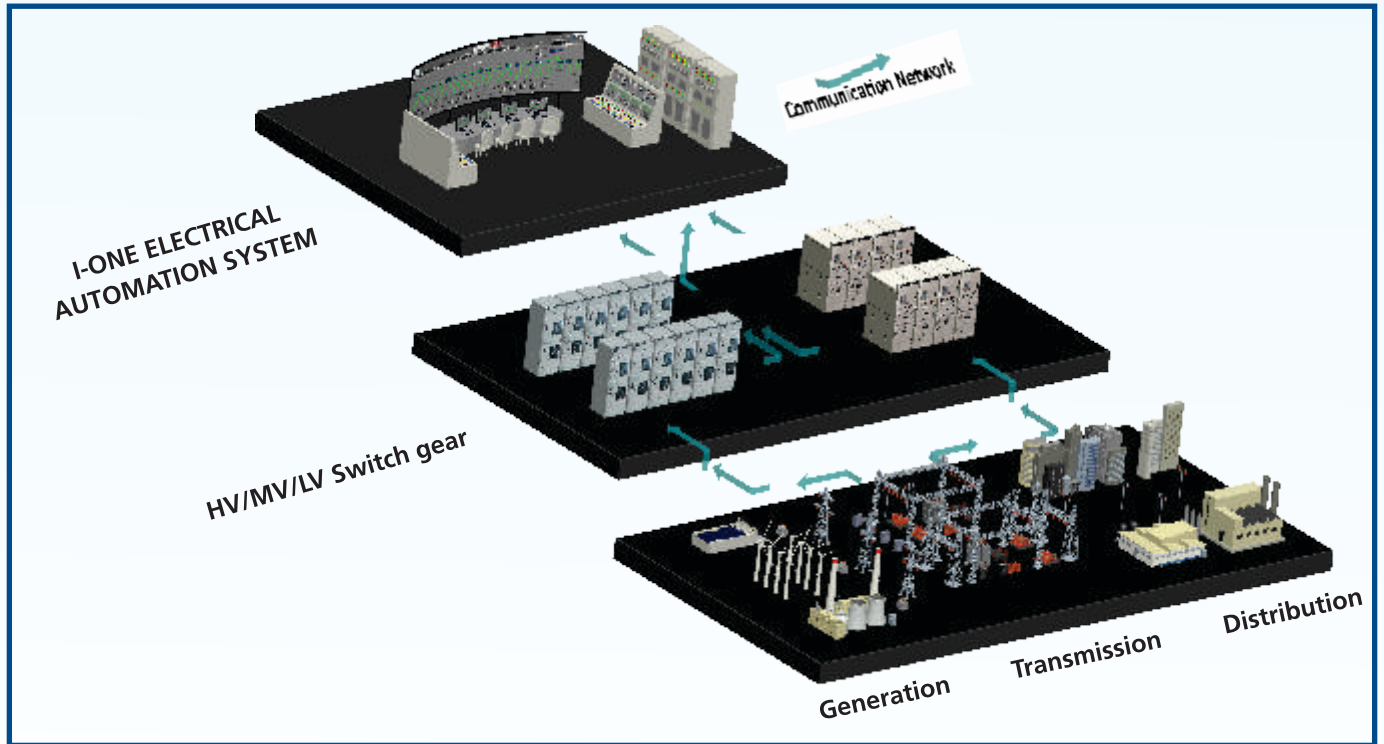
L&T's Electrical & Automation group offers a wide range of advance solution through its state-of-the-art products and systems. Backed by world class in-house capabilities in technology development & customer support, L&T's products and systems are geared to offer complete customer satisfaction.

With several years of Industry experience, we, as in L&T's **'Relays & Integration Solutions (R&IS)'** provide a one stop solution for all Substation Automation needs. With growing track records of contributing towards successful, intelligent Low & Medium Voltage solutions, we can offer most up-to-date Data Concentrator / CCU / SCADA / PLC based integrated substation automation solutions over a wide range of communication protocols.

“one stop solution”

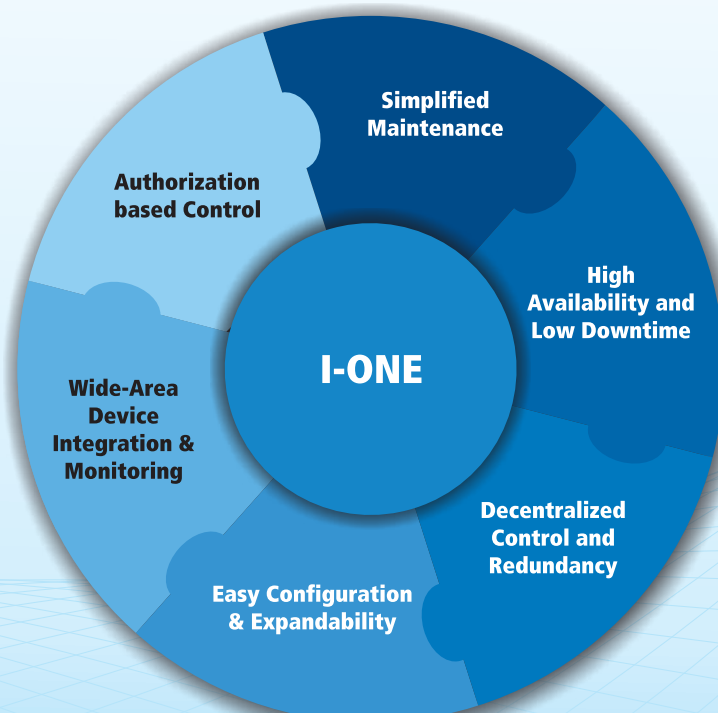


I-ONE ELECTRICAL AUTOMATION SYSTEM



I-ONE Electrical Automation System is also known as Integrated Power Management System (IPMS) / Power Management System (PMS), typically includes Integrated Protection Control & Monitoring System (IPCMS), Generator Management & Load Sharing System (GMLS), Load Shedding System (LSS), Electrical Asset Management System (EAMS), Fault Management System (FMS). Depending upon the project requirement any combination of the above modules can be chosen. I-ONE integrates IED's with the centralised control system. L&T's I-ONE

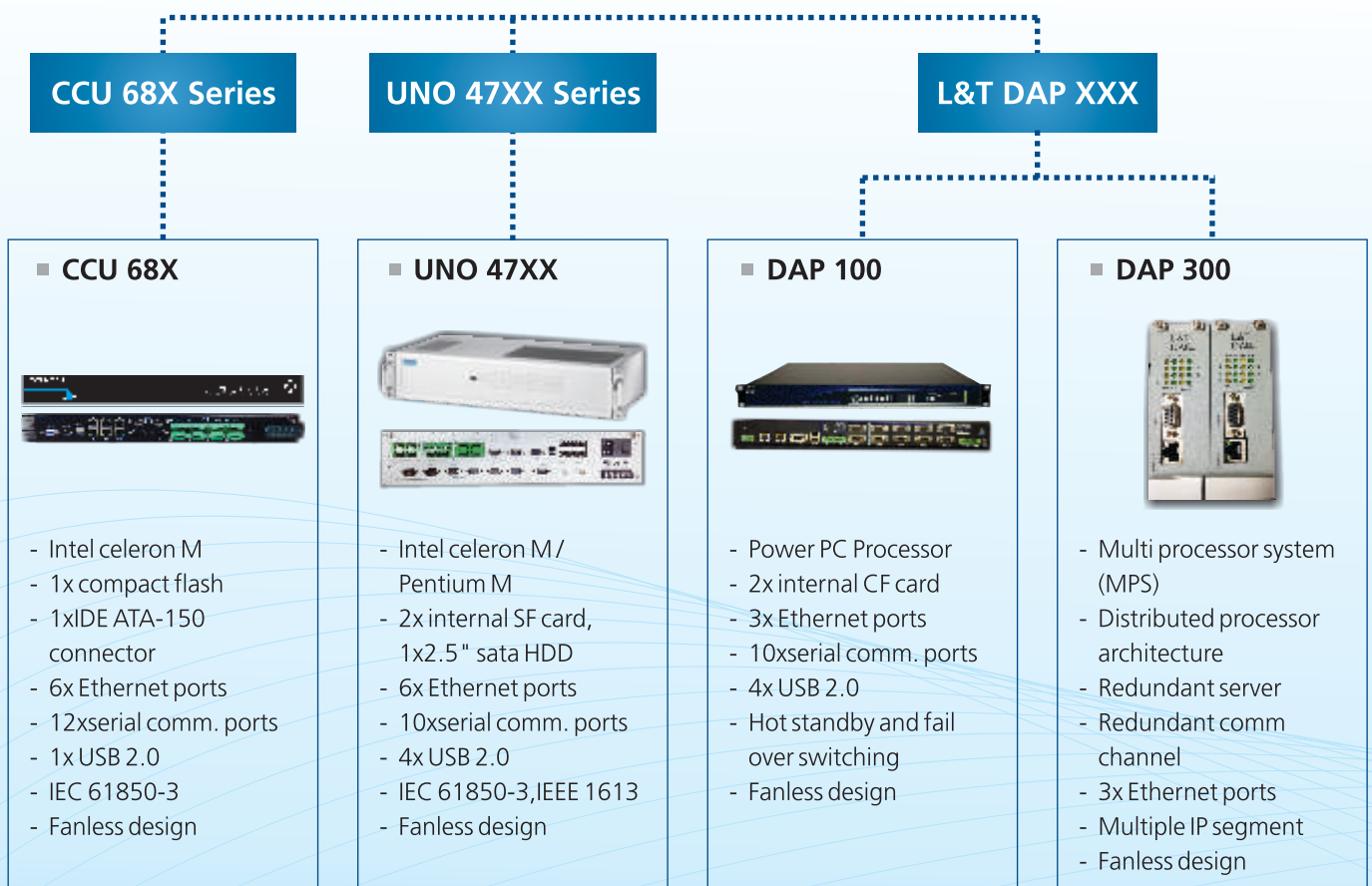
solutions are typically used in industry segments such as **Oil, Gas, Steel, Cement, Electrical & Water utilities and Data Centers**. Based on the information received from remote stations, automated or operator-driven supervisory commands can be pushed to remote station control devices, which are often referred to as field devices. Field devices control local operations such as opening and closing of contactors and circuit breakers, collecting data from sensor systems, and monitoring the local environment for alarm condition.



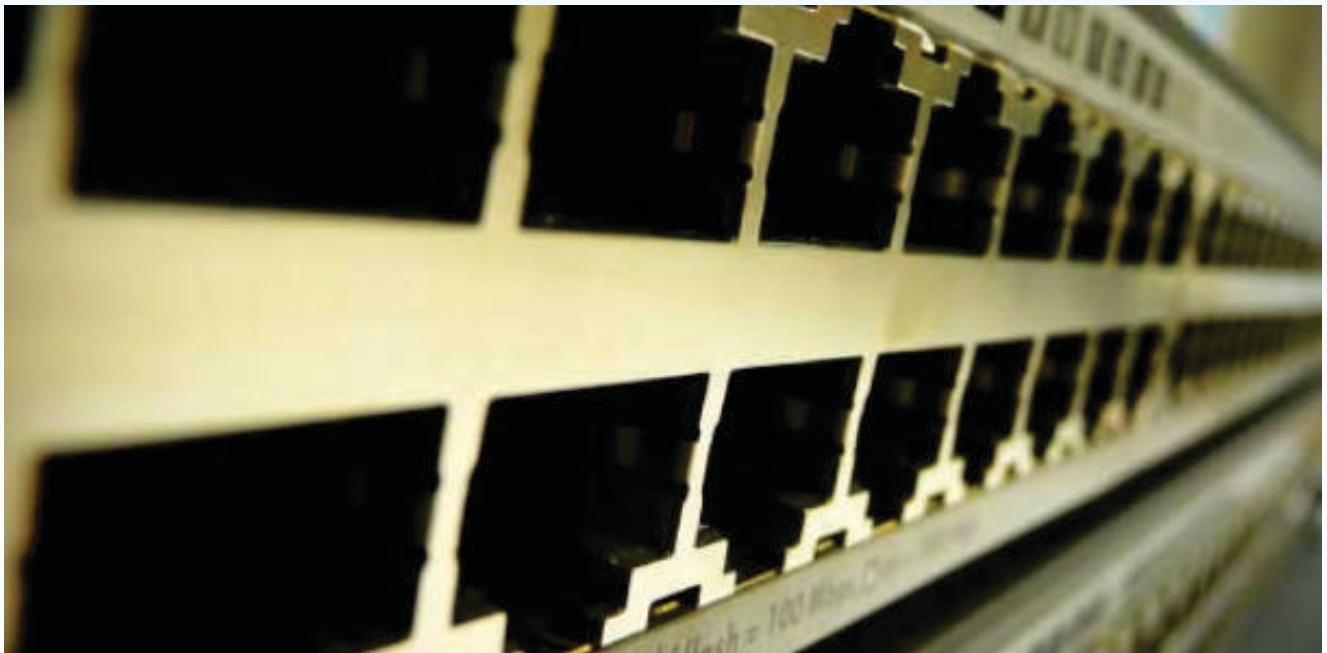
I-ONE ELECTRICAL AUTOMATION SYSTEM



The I-ONE Panel mainly consists of the Centralized Controller, namely, L&T DAPserver™, which facilitates monitoring and control of the overall substation. L&T DAPserver™ product line is designed for utility power distribution and industrial power distribution environment. DAPserver™ has the FLEXIBILITY to build a RELIABLE, SIMPLE TO CONFIGURE & EASY TO MAINTAIN system to meet your substation automation needs. L&T DAPserver™ enables the integration of field devices, unification of Substation data, and interface with enterprise applications to secure delivery of substation information to users.



L&T MANAGED ETHERNET SWITCHES



LT 2X Series

LT 1X Series

- LT 20GF
- LT 20G



- LT 22GF



- LT 26G
- LT 24G



- LT 28G



- LT 10G



FEATURES

- Rack /Din Rail mount design with field changeable line modules
- Hot-swappable power supply modules
- Slots for fast Ethernet and gigabit line modules & High Capacity uplinks (4 x 10G Copper or Fiber)
- Mixed power, single input 120-370VDC or 85-264VAC with additional 10 - 48VDC backup
- IEC 61850 & IEEE 1613 Compliant
- Fortified for IEC61850 & IEEE1613
- IEEE 1588 PTP v2 – Precision Timing Protocol time synchronization (TBD)
- IEC62439 Redundancy using HSR and PRP modules (TBD)
- i-Ring, RSTP, MSTP
- RIP, OSPF, VRRP, PIM-SM and PIM-DM, MPLS
- Multimode or Singlemode SFP (LC Based)



IEC 61850-3 /
IEEE 1613 Compliant



RoHS
COMPLIANT
EN60950



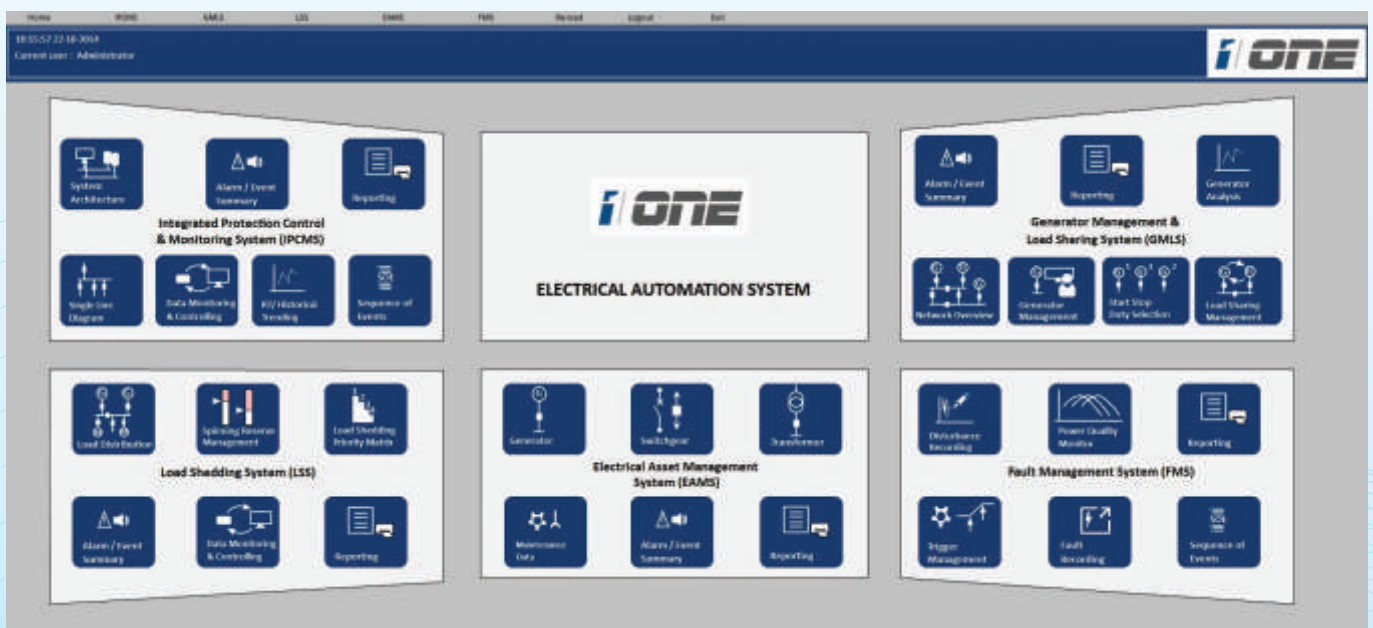
UL
LISTED
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I-ONE ELECTRICAL AUTOMATION SYSTEM - SCADA SYSTEM



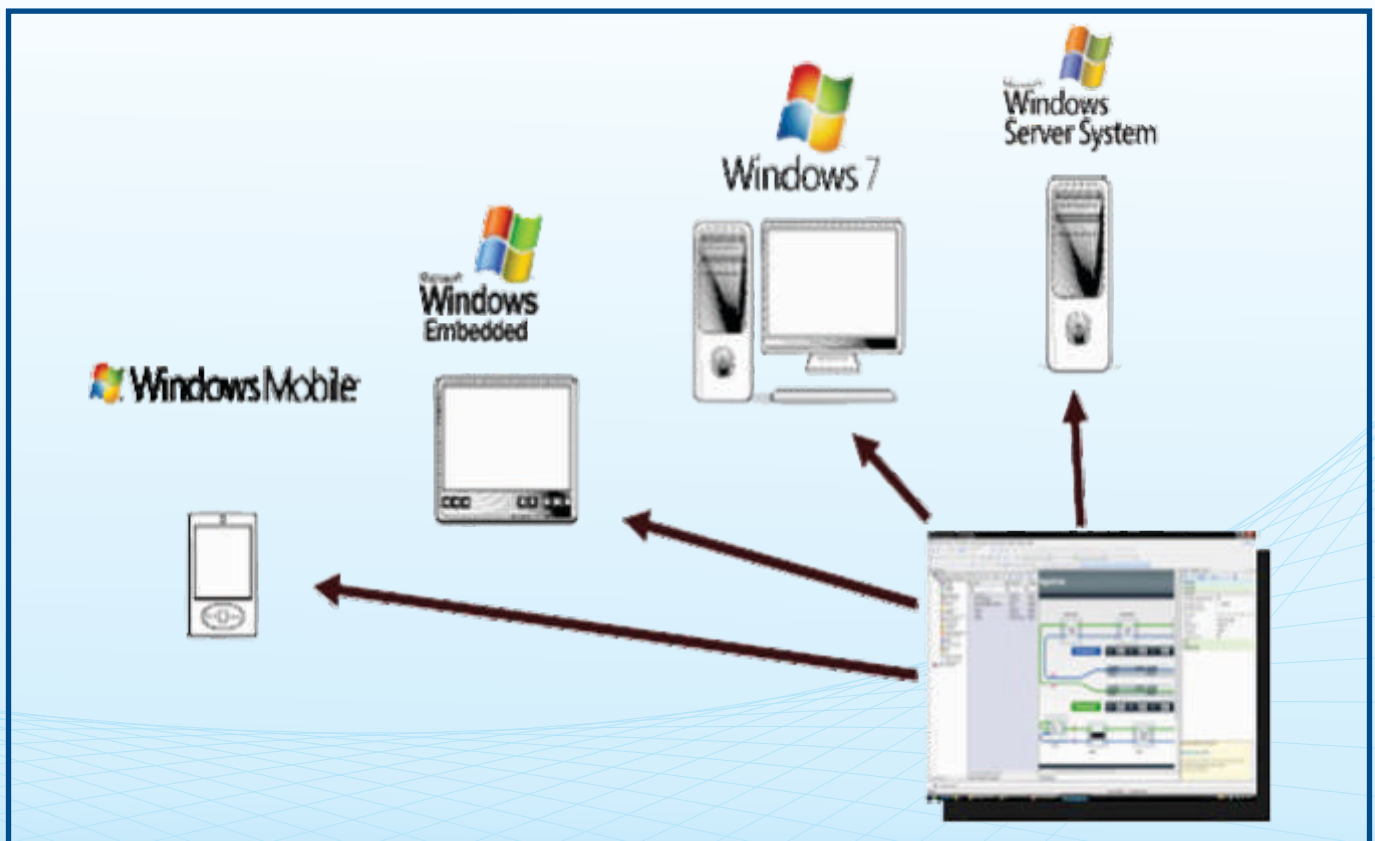
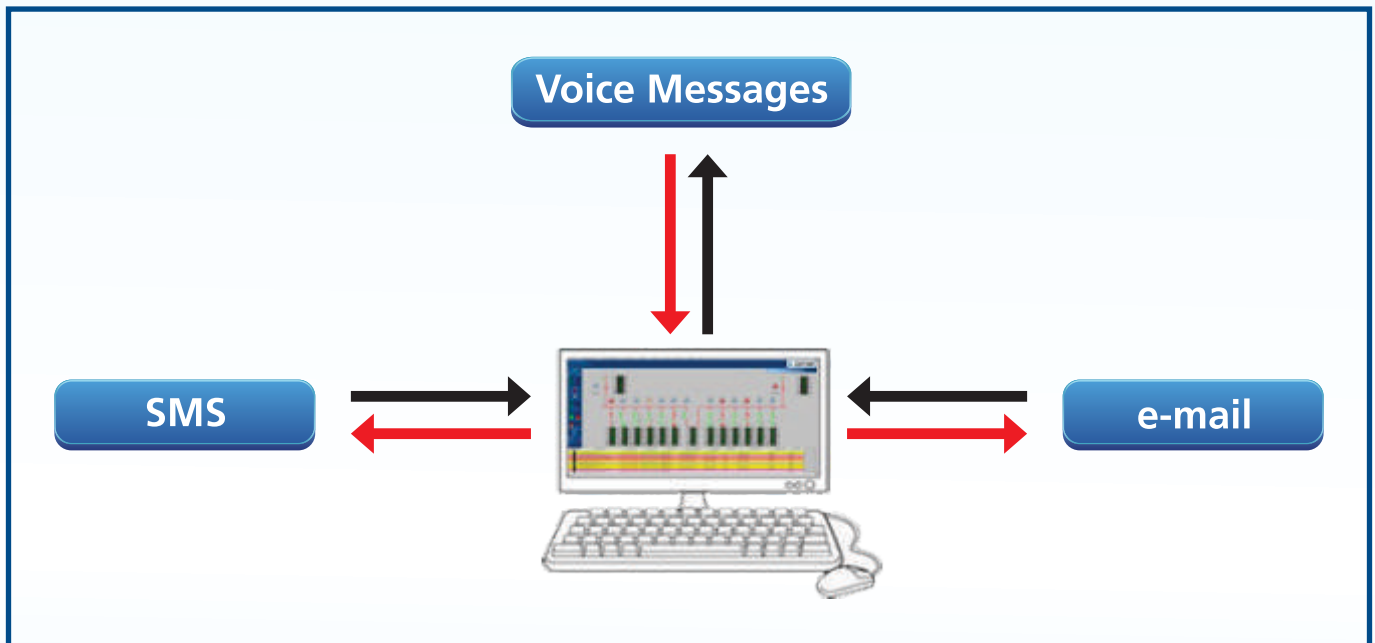
I-ONE system use LnTSCADA platform for remote monitoring and controlling. It allows users to monitor an entire plant or individual pieces of equipments and processes by collecting real-time data from various devices throughout a network. It is very important for organizations to monitor these network activities, as doing so informs them of the problems with their mission-critical processes. By monitoring these processes, organizations can quickly respond when there are problems within their network.

LnTSCADA™ is reliable, flexible and high performance monitoring and control solution designed to collect, record, store, analyze and present data collected from devices such as numerical relay, multi function meter, UPS, VFD, battery bank, DG, GTG etc. by using available standard modules (IPCMS, GMLS, LSS, EAMS, FMS). LnTSCADA™ is KEMA Certified and comes with IEC 61850 driver & supports 1000+ additional equipment drivers. It also comes with soft PLC module ,which supports IEC 61131 programming language. Easy-to-use configuration tools and powerful features enable faster development and deployment of any size of application.



KEY FEATURES

- Alarm Administration
- Chronological Event List
- Native communication drivers
- Diagnosis Viewer
- Extended Trend
- Historian
- Language Switch in Runtime
- Logic Workbench - IEC 61131-3 Compliant
- Network Management
- PLC Diagnosis
- Graphical symbols as per IEC 60617
- WebServer
- Secure command processing
- Targeted & Individual notification
- ActiveX, VBA developer wizards

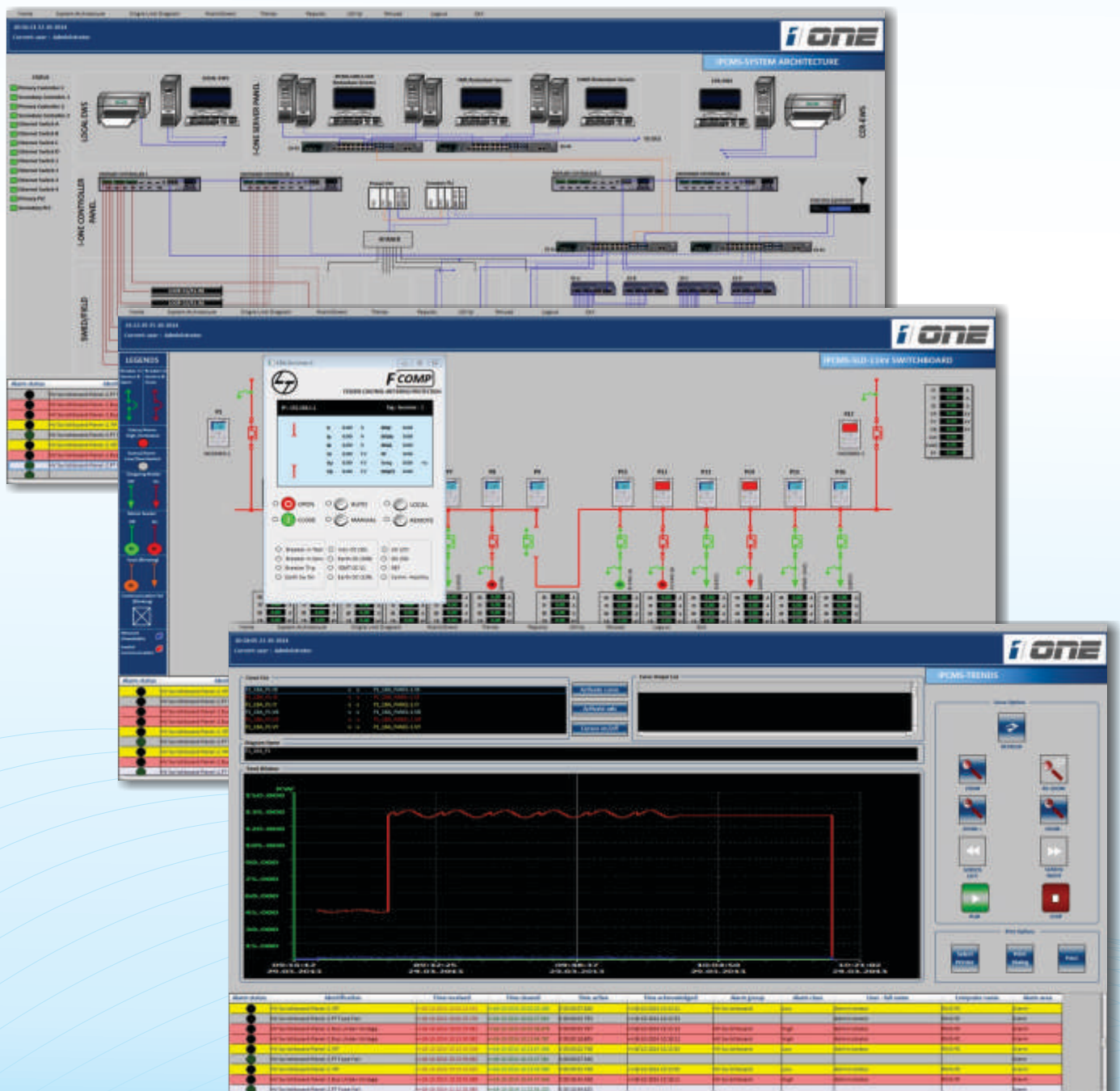


INTEGRATED PROTECTION CONTROL & MONITORING SYSTEM (IPCMS)

IPCMS- Integrated Protection Control & Monitoring System also known as EMCS ,SCMS,ENMS,ELICS. It integrates IEDs , situated at various location such as LV ,MV, HV Switchboard, UPS, APFC ,HVAC system etc ,with the centralised control system.

KEY FEATURES

- Data acquisition, monitoring & control
- Alarms & Events Management
- Distribution Network Control
- Real Time Monitoring
- Offline Simulation & Online Debugging
- Dynamic Trend Element
- Energy Reporting
- Online Analysis Tool

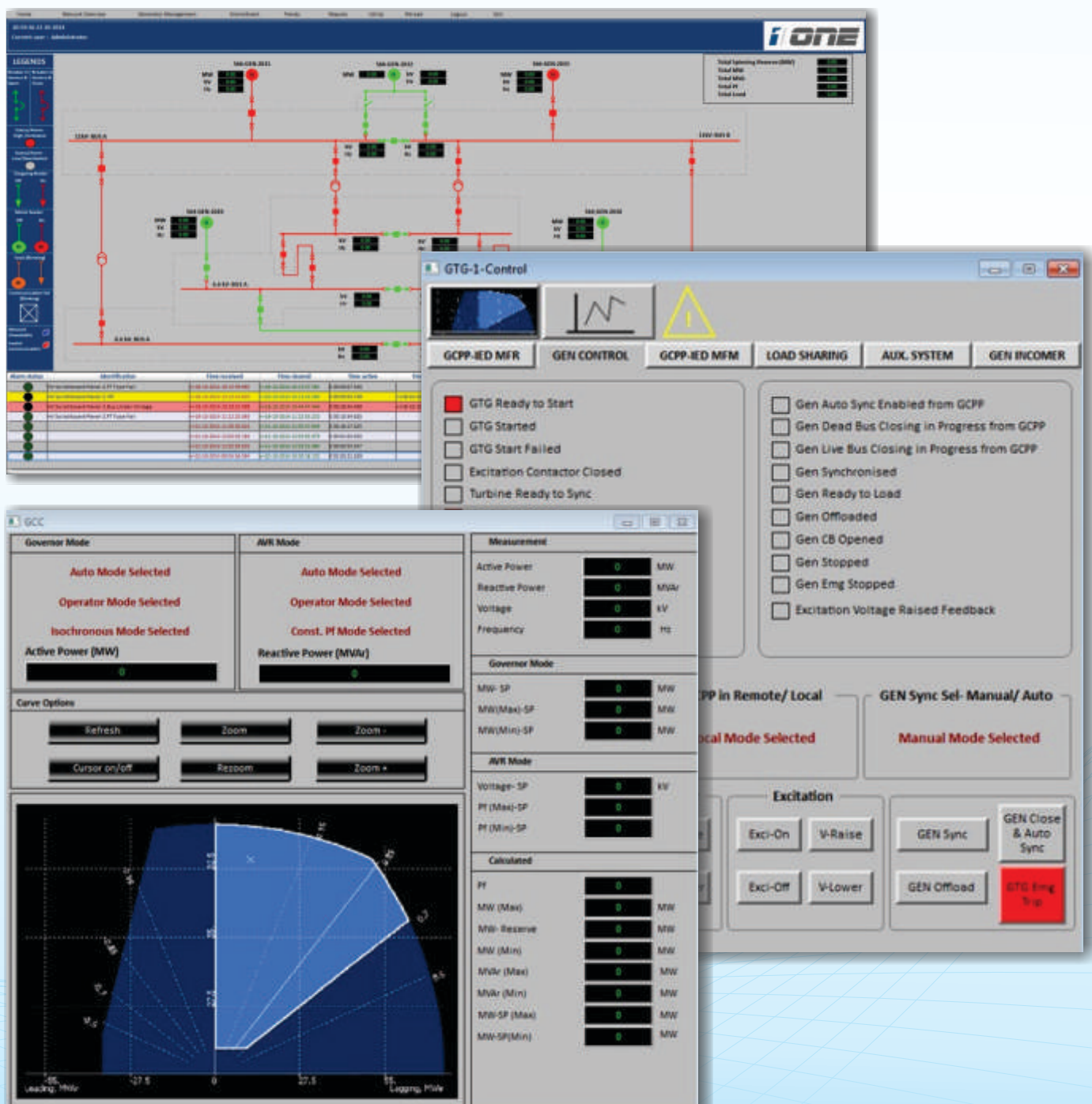


GENERATOR MANAGEMENT & LOAD SHARING SYSTEM (GMLS)

GMLS- Provides generator control & monitoring ,parallel operation management, load management, load sharing control and synchronisation.

KEY FEATURES

- Generator control & measurement
- Start & Stop Duty selection
- Spinning reserve management
- Active and Reactive load sharing
- Generator and group synchronisation
- Frequency and power control
- Alarm/SOE
- Report




LOAD SHEDDING SYSTEM (LSS)

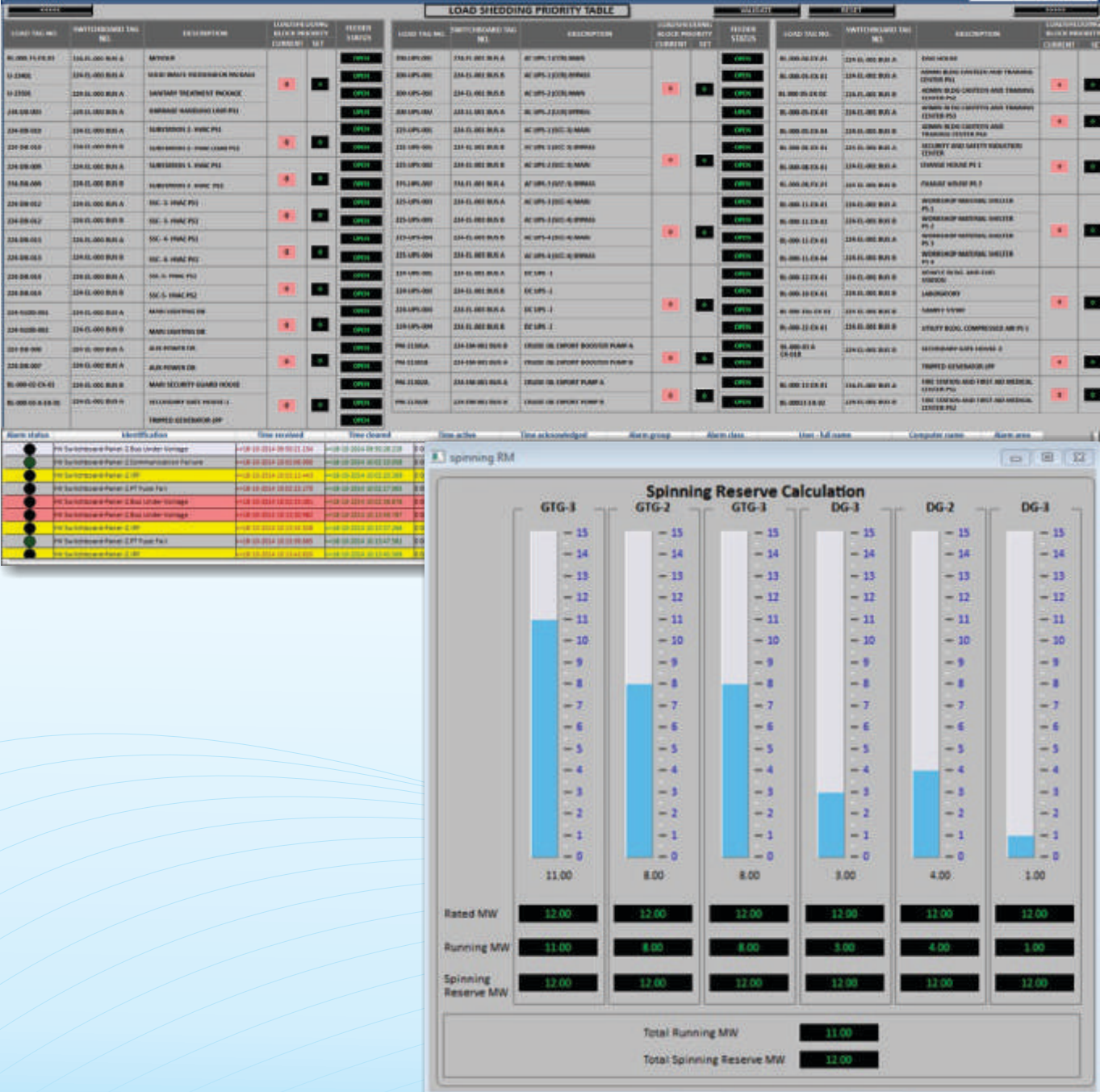
KEY FEATURES

KEY FEATURES

- [Home](#)
[Network Overview](#)
[Generator Management](#)
[Alarm Event](#)
[Trends](#)
[Reports](#)
[Setting](#)
[Period](#)
[Logout](#)
[Exit](#)

12:59:33 25-10-2018
Current user : Administrator



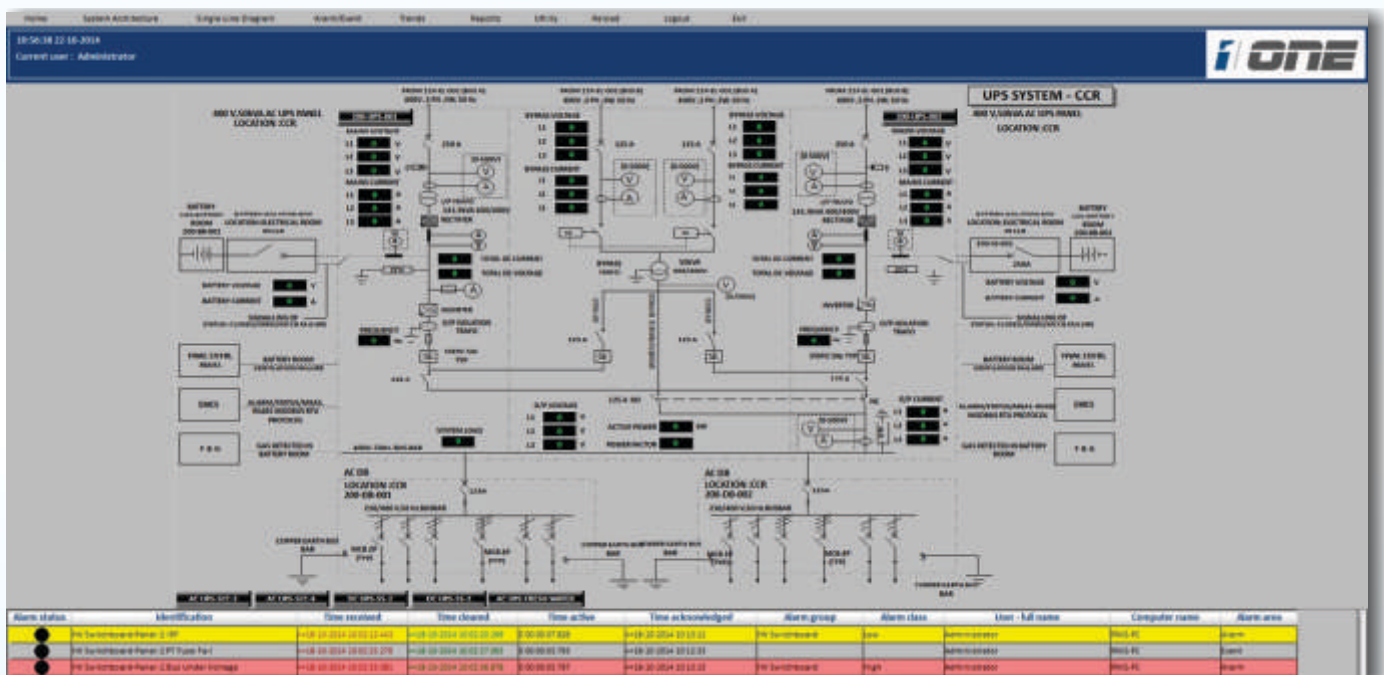


ELECTRICAL ASSET MANAGEMENT SYSTEM (EAMS)

Electrical equipment is designed to provide efficient and reliable operation when properly maintained. I-One EAMS modules provide a reliable platform for the maintenance data calculation by reading critical data, machine health data from the equipment like.. Generator, Transformer, Switch gear, motor etc.

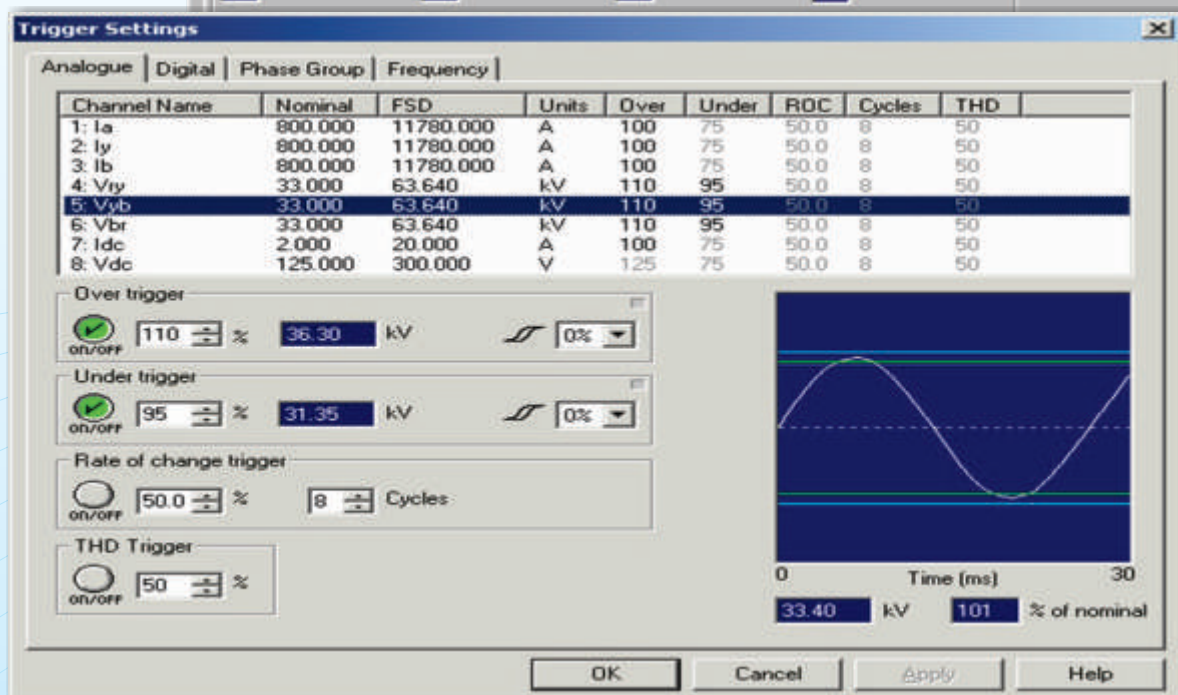
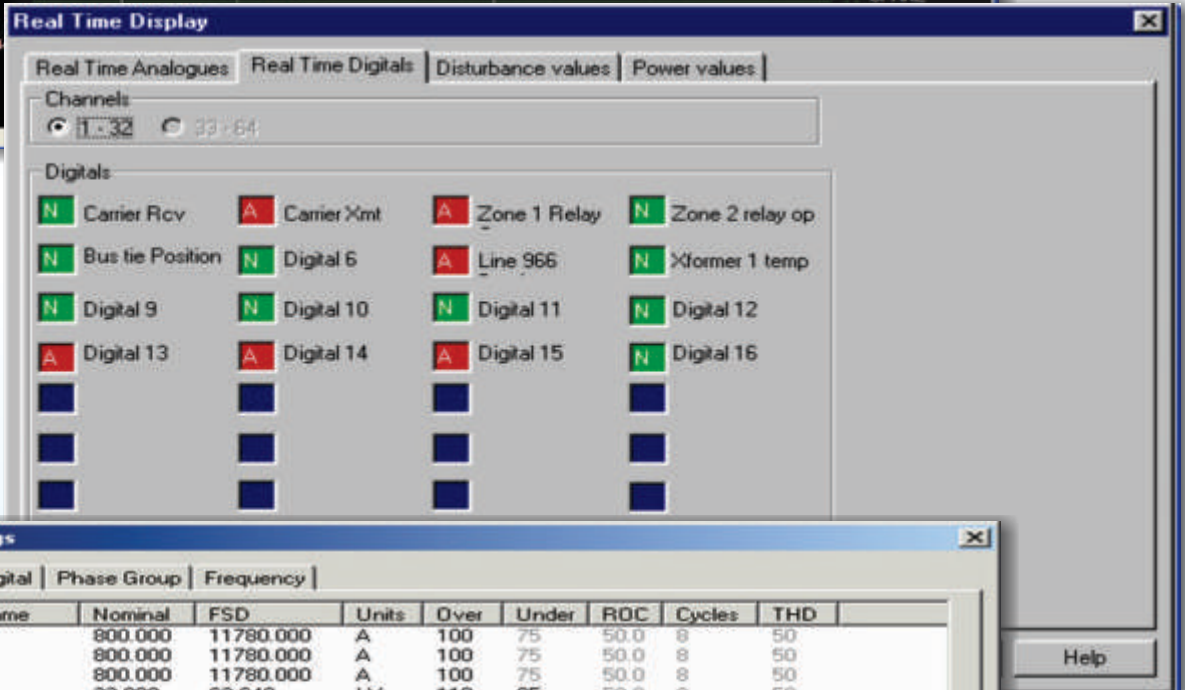
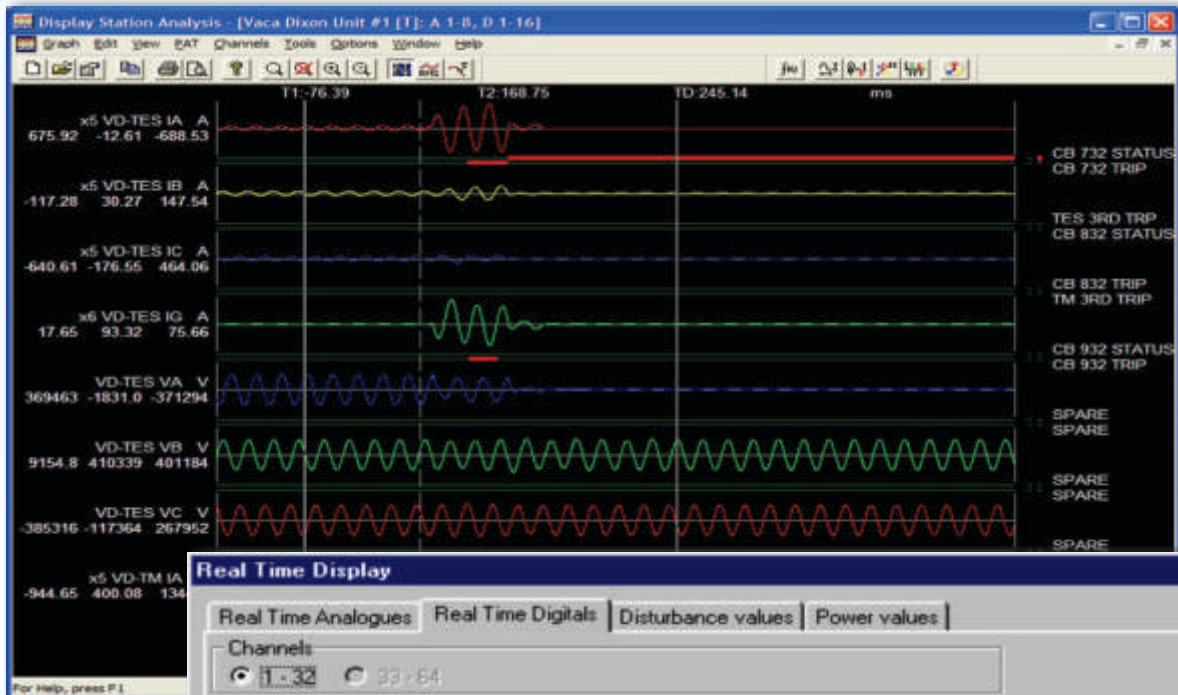
KEY FEATURES

- Online monitoring of critical parameters associated with Equipment
- Equipment/Machinery performance monitoring
- Maintenance data
- Equipment statistics
- Integrated Alarm and Reporting
- Trending of critical parameters



FAULT MANAGEMENT SYSTEM (FMS)

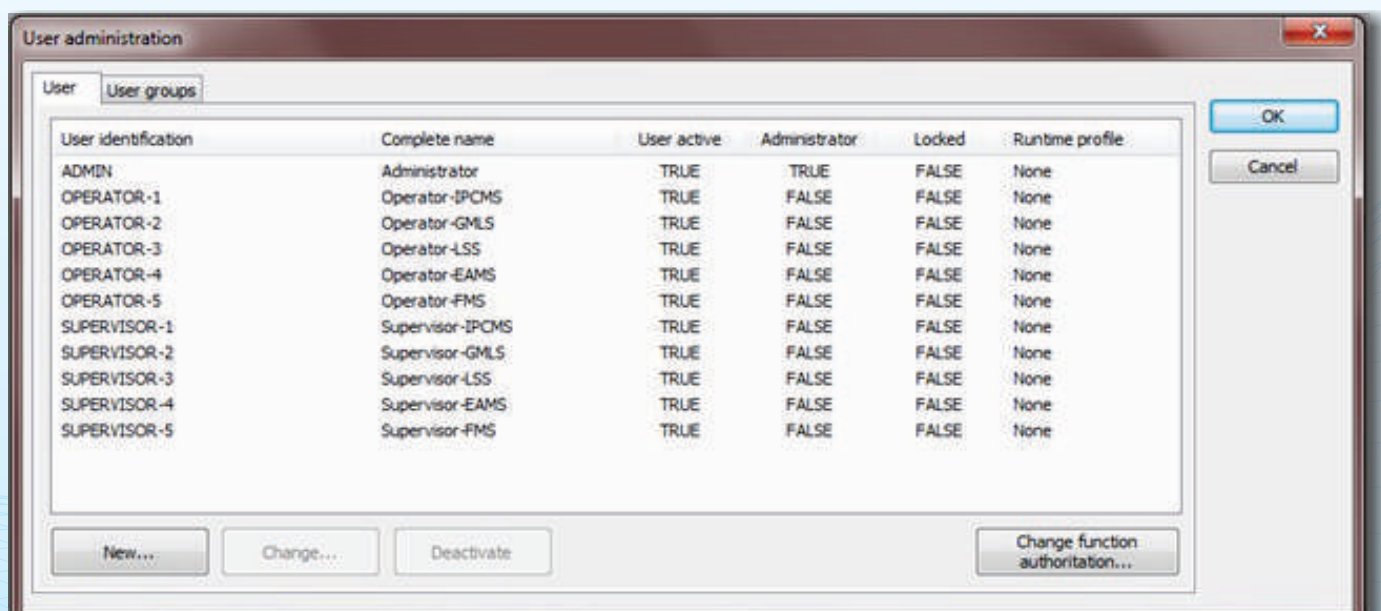
I-one FMS module provides capability to capture and analyze short transient events, longer-term disturbances and trend input quantities such as RMS, frequency, harmonics, power and power factor etc..



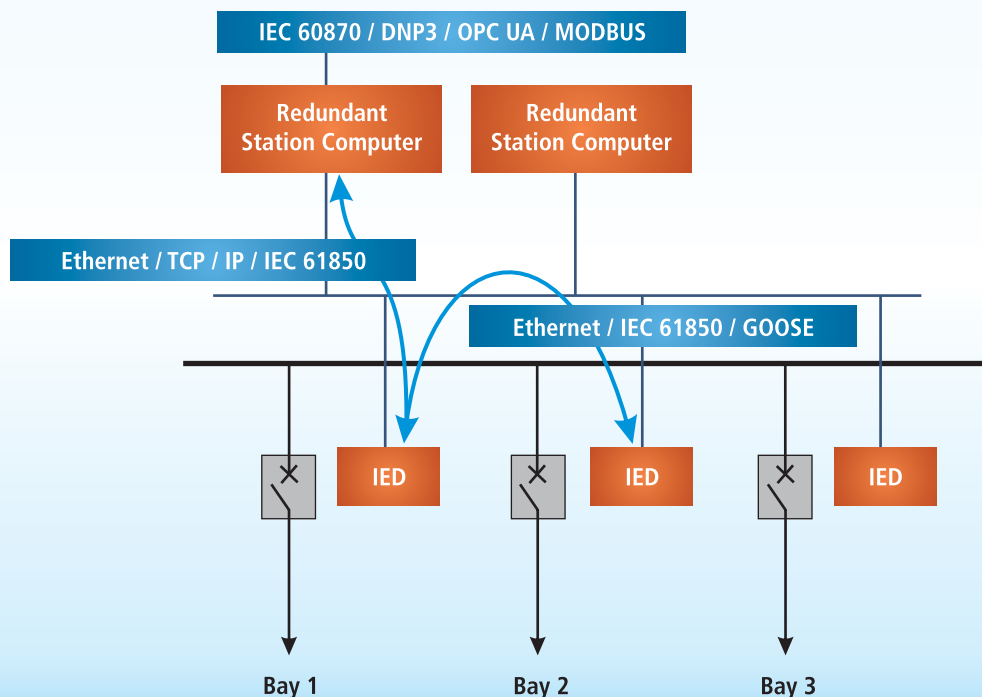
LnTSCADA SECURITY FEATURES

LnTSCADA offers a comprehensive security package, which is impressive due to the consistency of the numerous features included:

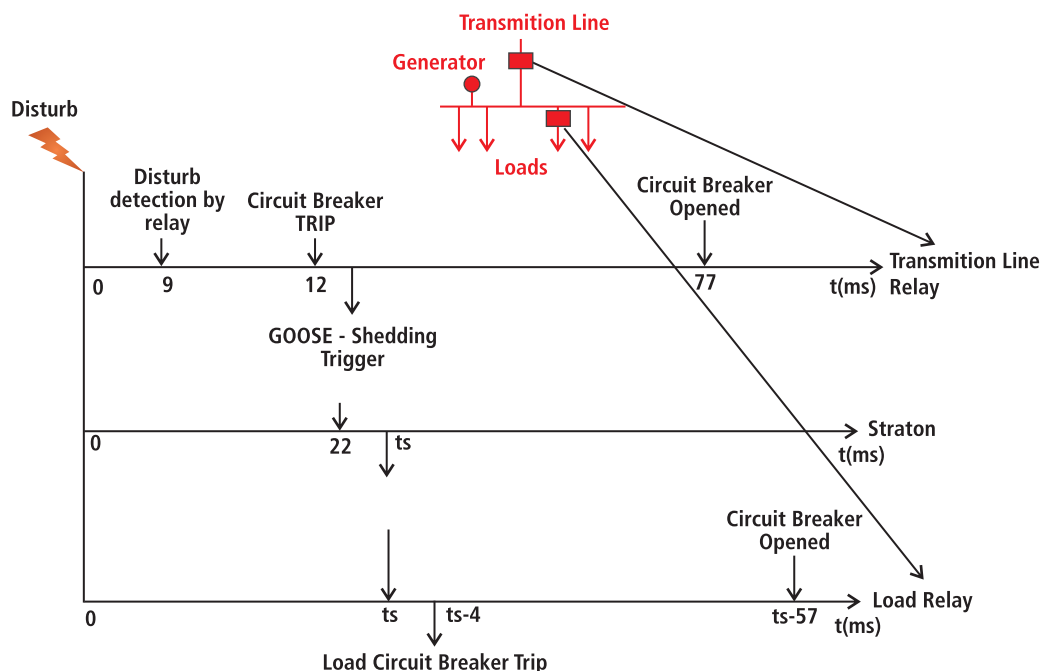
- File signature: LnTSCADA recognizes manipulated program files.
- Strong encryption: 128 bit communication encryption between server, standby server and clients in the network and in the communication with web clients.
- Authentication: Only authenticated clients gain access to a LnTSCADA server.
- http-tunneling for web server.
- OPC-UA: Client and server supported certificates and user authentication.
- Status processing
- User Administration: full support for Active Directory
- Password protection in Runtime and Editor
- Change history and backup in the Editor
- Diagnosis Server diagnoses errors in the network and in control communication
- Password protection in zenon Runtime and Editor and much more...



L&T implementation of Electrical Automation System/ Power Management system includes integration of SCADA logic and soft PLC/ Hard PLC with embedded controllers to manage power consumption , optimize system performance, monitor network energy ,load sharing and load shedding during overload conditions.



IEC 61850 GOOSE LOAD SHEDDING



I-One uses windows platform for load shedding applications. The following can be done in 12msec using L&TI-One Solutions

- Receive a GOOSE message from the source device
- Calculate the logic
- Send the GOOSE message to the load shedding devices switching the loads

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