

NOVEMBER 2023

ALMAS

Advanced Local Monitoring And SCADA

Automate Industries

Application Areas

Substation Automation (SA)
Power Plant Automation



Industry



SCADA



Agenda

- Introduction
 - Challenge in Substation Automation Systems
 - nPTO Offer
- Flexibility and Scalability
- Features
- Communication
- Cost Saving
- Application Picture

Introduction – Challenge in Substation Automation Systems (SAS)

Customer Challenge

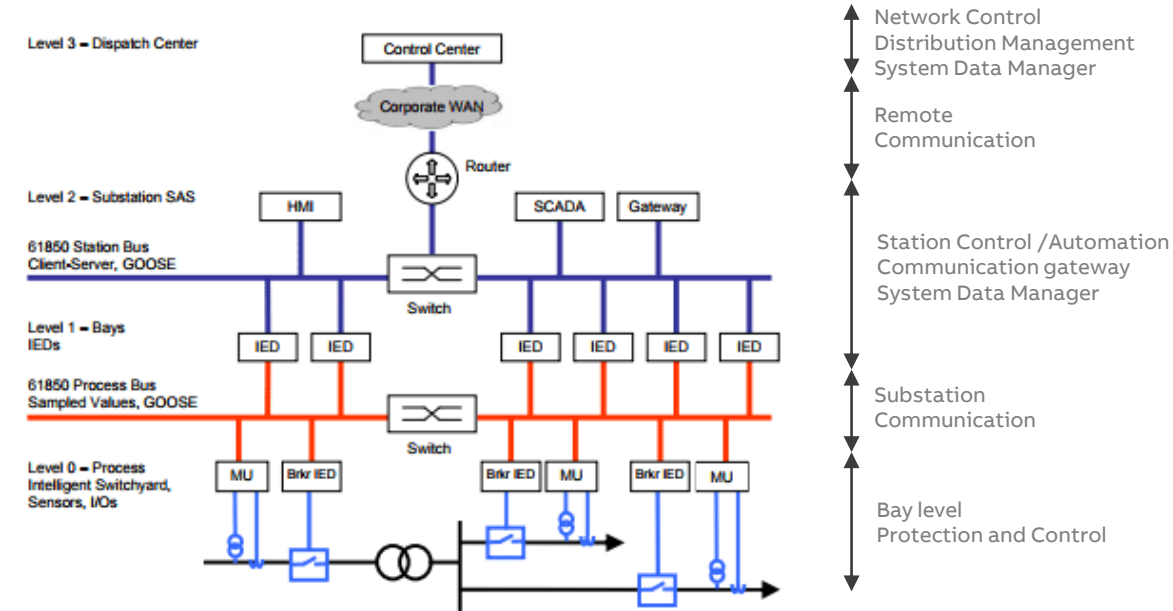
Automate the substation with remote control

nPTO Solution

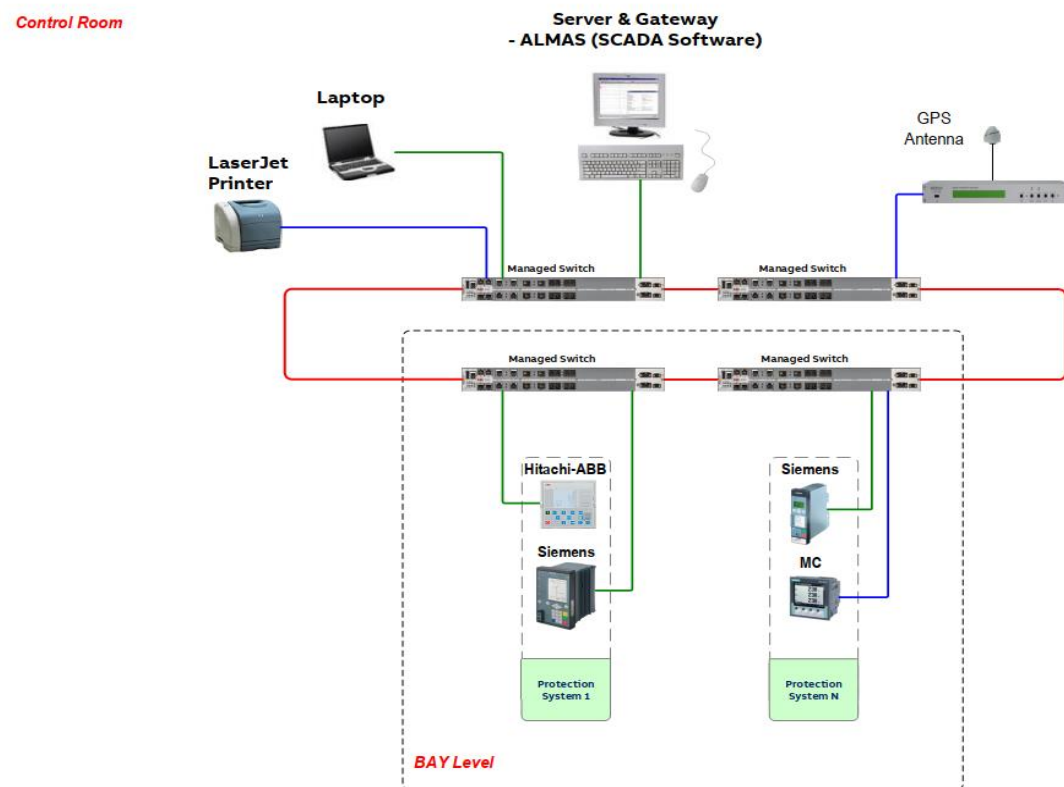
ALMAS software as an automation product
Communication with IEC 61850 Ed.1 and Ed.2

Customer Benefits

Operator Support
Flexible and Scalable
Long-term Stability
Cost Saving



Introduction – Challenge in Substation Automation Systems (SAS)



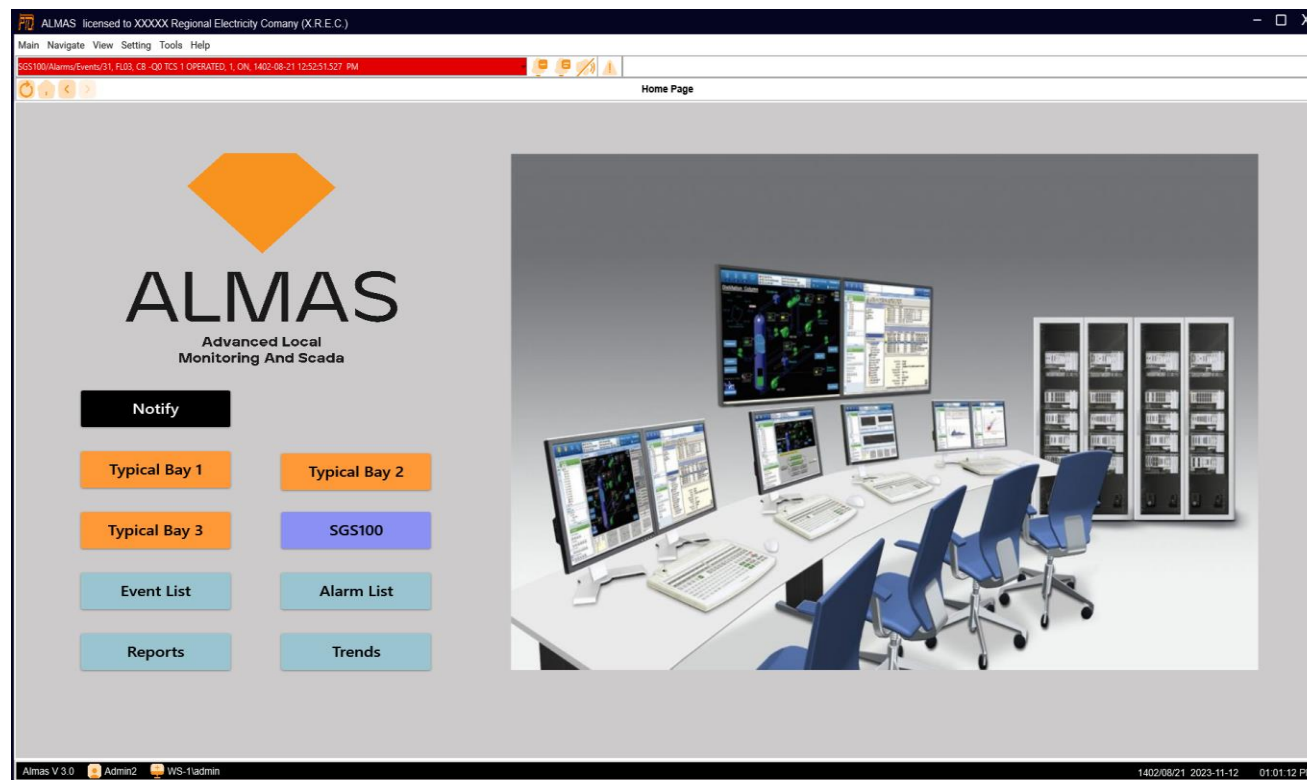
Introduction - nPTO Offer

Our Solution

- Control Functionality
- HMI (Human Machine Interface)
 - Real-time Monitoring
 - Graphical HMI
 - Alarms and Events
 - Reports and Trends
- Disturbance Records Monitoring
- Activity Logging and User Management

Benefits

- Easy and Simple Engineering Environment
- Enhanced Operational Performance
- Flexible / Scalable / Stable Operation
- Cost Saving



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Flexibility and Scalability

Single System

- All features in one computer
System Server
Gateway Functionality
Operator/Engineer Workstation
- Solution is especially suitable for e.g.
Local HMI in Substation
Substation Gateway

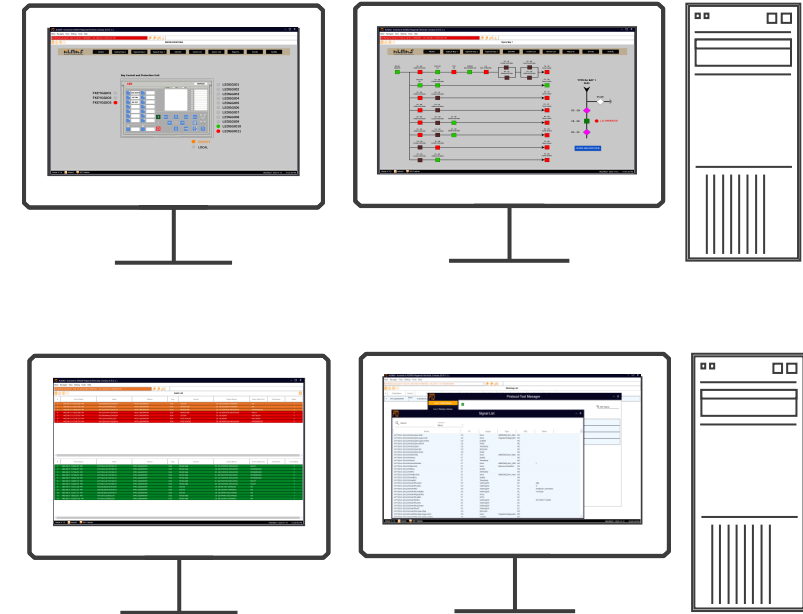


Single System With One ALMAS Software License

Flexibility and Scalability

Redundant System

- Features are doubled
 - Redundant System Servers
 - Redundant Gateways
- Malfunctioning in one computer will not cause any interruption in running the process
- Solution is especially suitable for systems demanding high availability in transmission substations



Two Systems With Two ALMAS Software Licenses

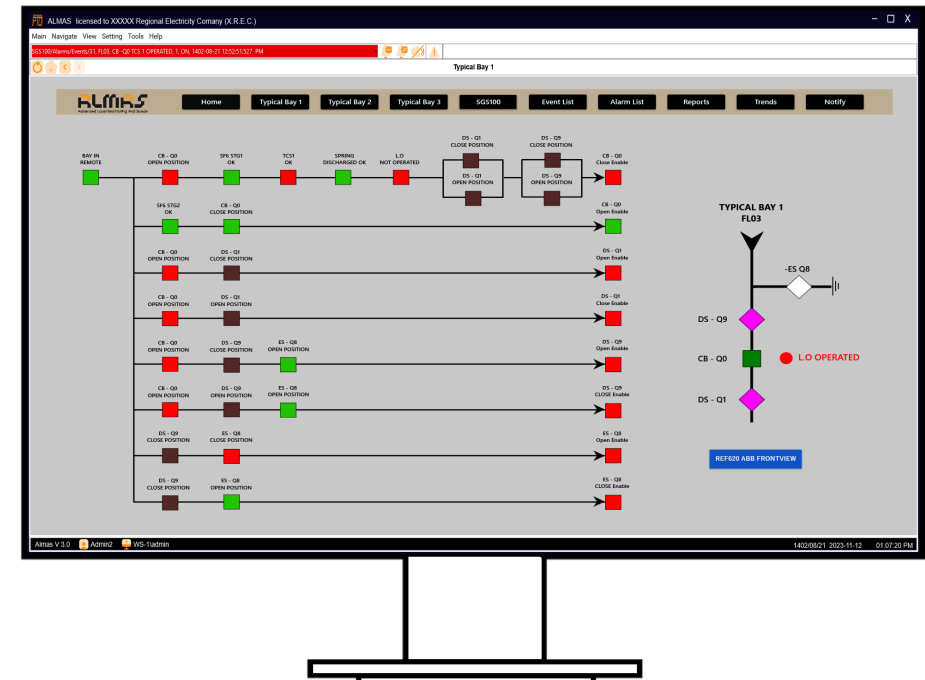
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- Introduction
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- **Features**
- Communication
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Features - ALMAS v. 3.0

Features

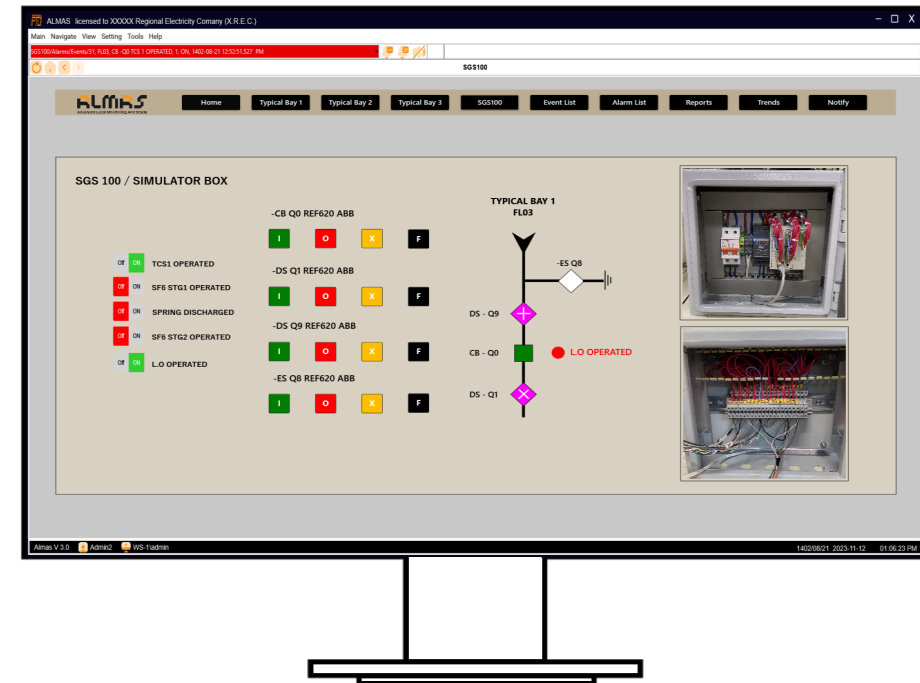
- Control Functionality
- HMI (Human Machine Interface)
 - Real-time Monitoring
 - Graphical HMI
 - Alarms and Events
 - Up to 5 Alarm Classes (urgent, non-urgent, ...)
 - Print Alarm and Event Lists
 - Excel export
 - Audible Alarm
 - Acknowledge/Reset one or all Alarms
 - Filtering based-on Time
 - Archiving Up to 3 years (Data Logging)



Features - ALMAS v. 3.0

Features (continued)

- Reports and Trends
- Gateway Functionality
- Different Communication Protocols
 - IEC-61850 Ed.1 and Ed.2
 - IEC 60850-5-101
 - IEC 60850-5-104
 - Modbus (RTU/TCP/ASCII)
- Disturbance Records Monitoring
- Gregorian/Persian Calendar
- Self Supervision
- Supporting OS windows 7/8/10/11



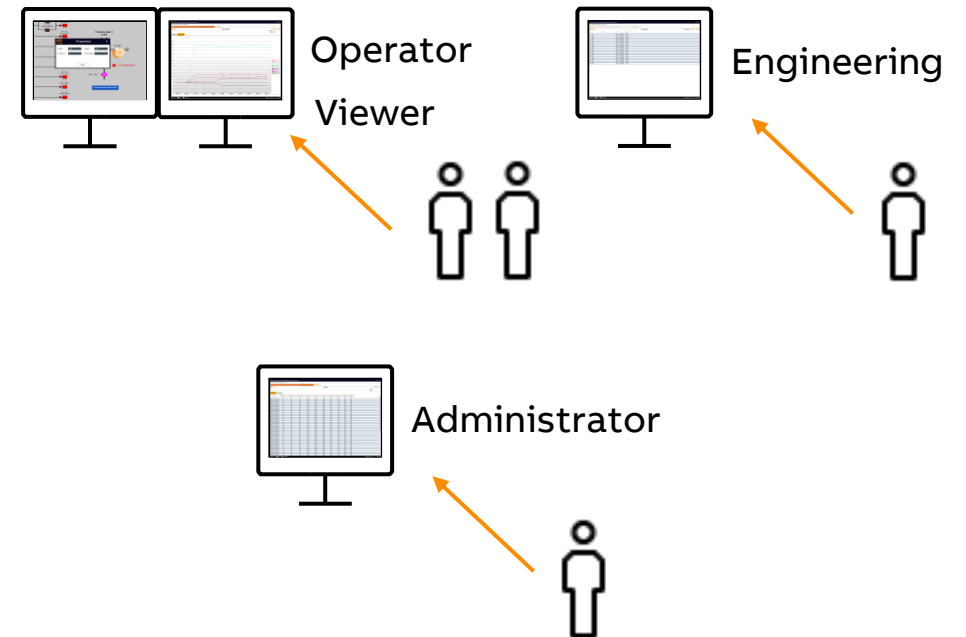
Features - ALMAS v. 3.0

Special Features

- Activity Logging
- User Management
 - Different Users
 - Different Roles
 - Viewer
 - Operator
 - Control
 - Engineer
 - Administrator

Benefit

- Apply policies regarding system access
- Prevent unauthorized people for different roles
- Reduce risk of mal-operation



Features - ALMAS v. 3.0

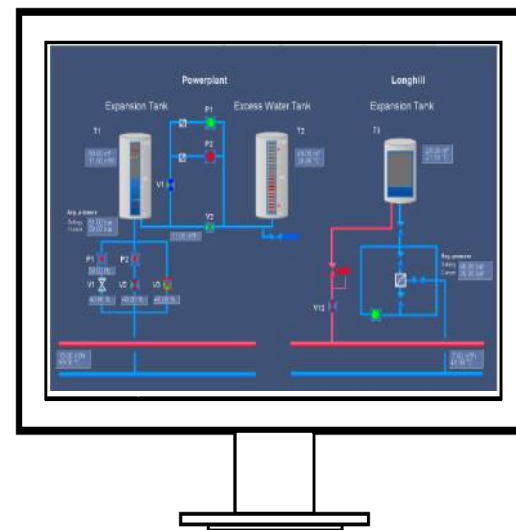
Extendable Library

Application examples

- Gas distribution industry
- Water distribution industry
- Other industries

Contents

- Protocols
 - whatever customers need can be applied as soon as possible
- Symbols
 - Pipes
 - Valves
 - Pumps
 - Etc (whatever customers need)



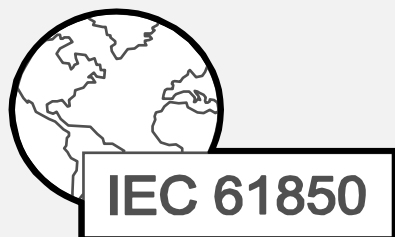
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Communication - IEC 61850 compliant

IEC-61850 Edition 1
Towards a global
communication standard
for substation Automation

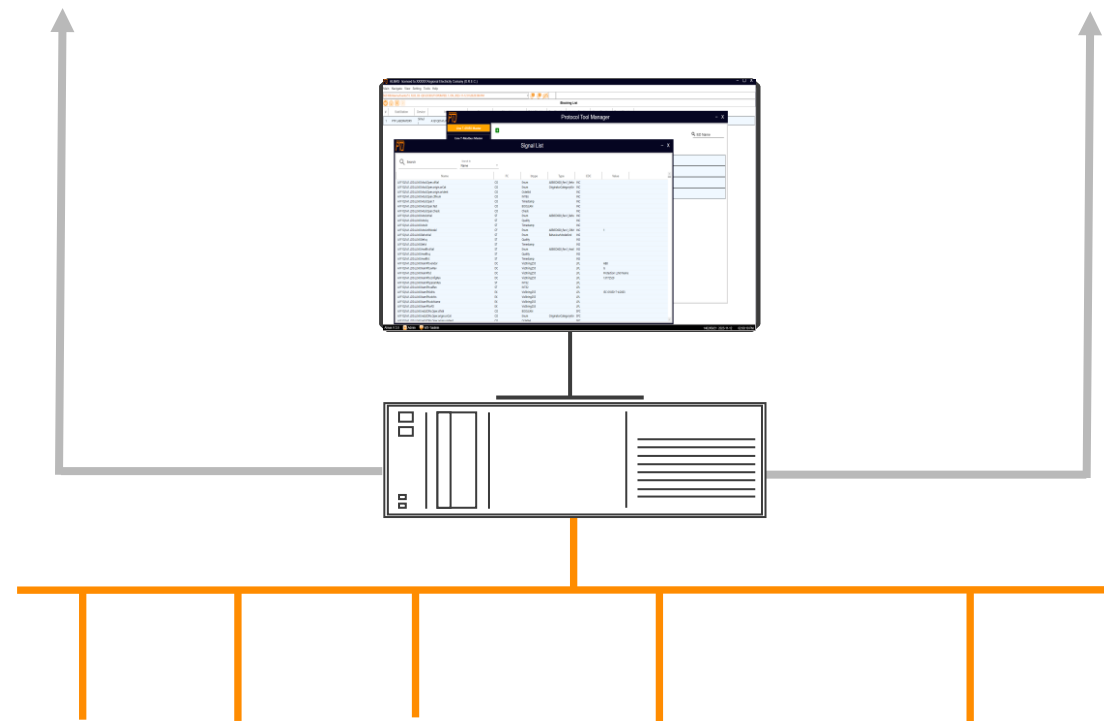
IEC-61850 Edition 2
A broad standard for
communication networks and
systems beyond substation
Automation



Communication

Master Protocols

- IEC 61850 Ed1 and Ed2
- IEC 60850-5-104
- Modbus TCP/RTU/ASCII



Communication

Slave Protocols

IEC 60850-5-101
IEC 60850-5-104



Communication

- Integration of 3rd Party IEDs verified in System Tests

HITACHI-ABB

SIEMENS

SCHNEIDER ELECTRIC

RELEMATIKA

ESFA (Iran)

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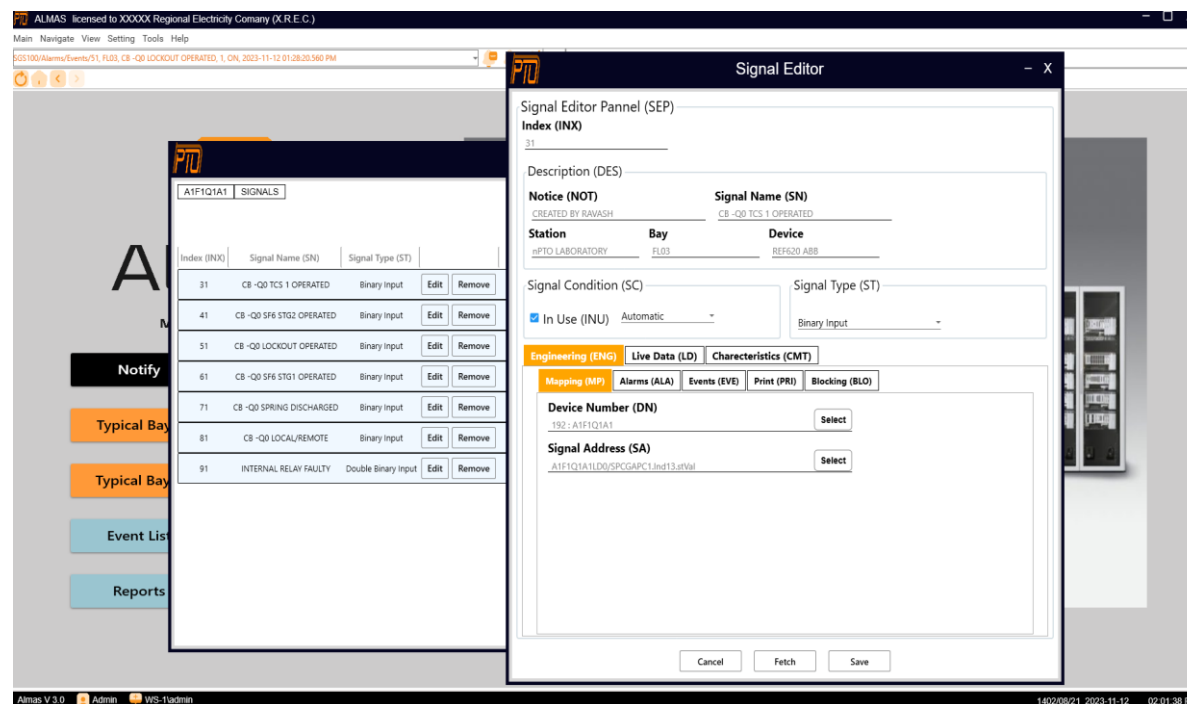
Cost saving

Dependability	ALMAS utilizes data processing with maximum level of assurance
Disturbance Analysis	Easy access to Event List of protection relays and downloading disturbance data with ALMAS
Control	Control of different types of objects
Maintenance	Defining alarms to maximize efficiency of maintenance
Report and Trend	Data Analysis

Cost saving

Dependability

- The objective of ALMAS is to access important information accurately under various circumstances in favor of dependability
 - * Real-time data integration
 - * Simple and customizable: minimum required time/knowledge to design HMI so that customer does not need unique skills nor binding to supplier



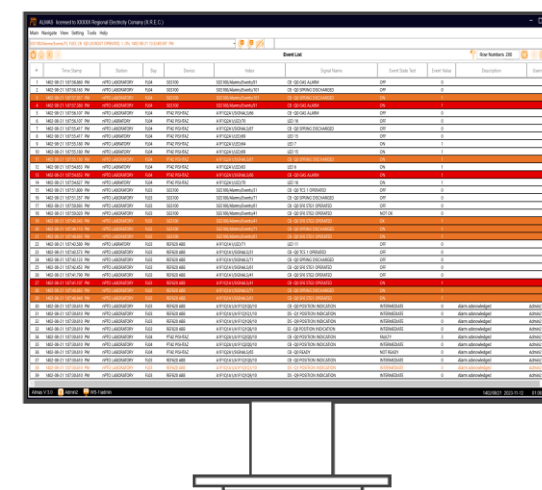
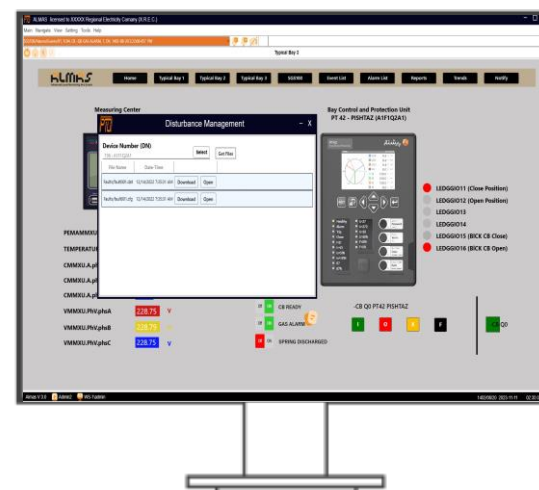
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Cost saving

Disturbance Analysis

- Easy access to Event List and disturbance data allows to analyze different types of faults
 - * Where and when did something happen
 - * Flexible timeline



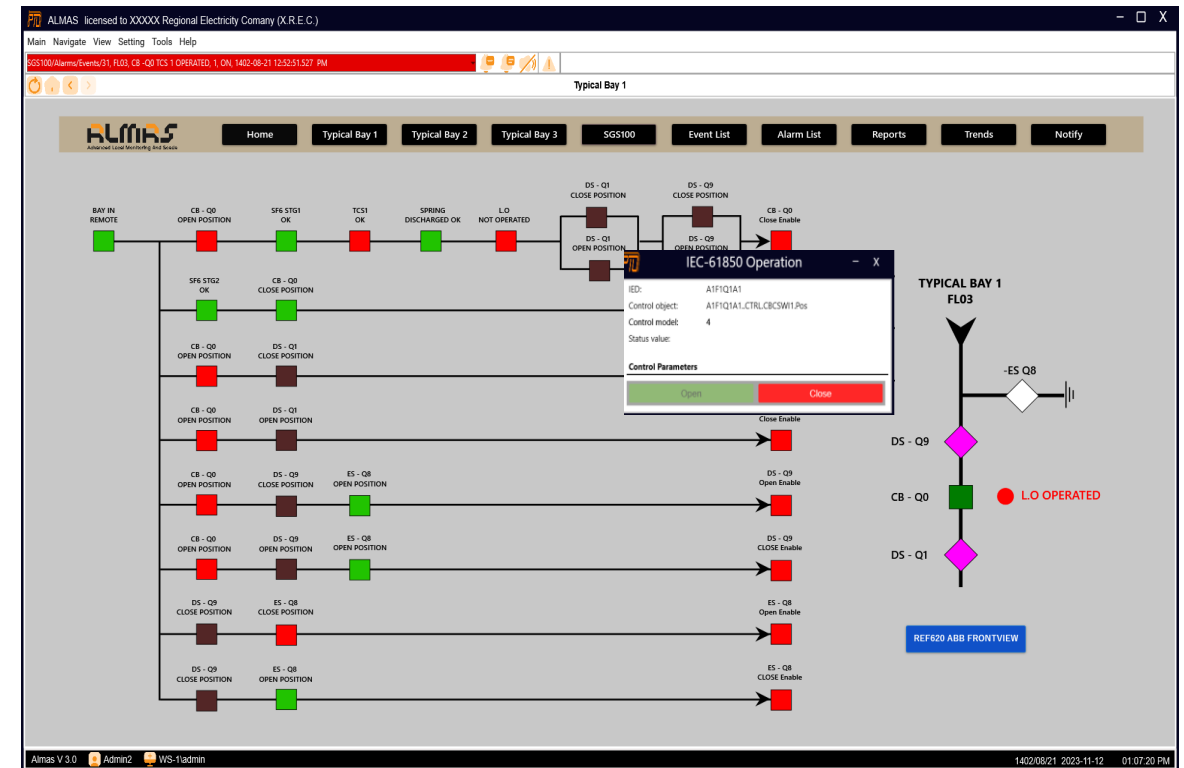
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Cost saving

Control

- Control of different types of objects, such as breakers, disconnectors and etc.
 - * SBO with enhanced security
 - * Direct with enhance security



Cost saving

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Cost saving

Maintenance

- Defining alarms to optimize interval of maintenance
 - * Urgent and non urgent alarms
 - * Fleeting and persisting alarms
 - * Acknowledged and unacknowledged alarms

ALMAS licensed to XXXXX Regional Electricity Company (X.R.E.C.)

Main Navigate View Setting Tools Help

SSS100/Alarms/Events/51, FLO3, CB -Q0 LOCKOUT OPERATED, 1, ON, 1402-08-21 1:28:20:590 PM

Alarm List

#	Time Stamp	Index	Station	Bay	Device	Signal Name	Event State Text	Username	Value
1	1402-08-21 1:28:20:590 PM	SSS100/Alarms/Events/51	rPTD LABORATORY	FLO3	SSS100	CB -Q0 LOCKOUT OPERATED	ON		1
2	1402-08-21 1:28:12:260 PM	ATF1Q1A1/SIGNALS/51	rPTD LABORATORY	FLO3	REF620 ABB	CB -Q0 LOCKOUT OPERATED	ON		1
3	1402-08-21 1:28:08:503 PM	ATF1Q1A1/ATF1Q1Q1/10	rPTD LABORATORY	FLO3	REF620 ABB	D5 -Q1 POSITION INDICATION	INTERMEDIATE		0
4	1402-08-21 1:28:02:940 PM	ATF1Q1A1/ATF1Q1Q9/10	rPTD LABORATORY	FLO3	REF620 ABB	D5 -Q9 POSITION INDICATION	FAULTY		3
5	1402-08-21 1:27:57:837 PM	SSS100/Alarms/Events/61	rPTD LABORATORY	FLO4	SSS100	CB -Q0 READY	NOT READY		0
6	1402-08-21 1:27:45:733 PM	ATF1Q2A1/SIGNALS/65	rPTD LABORATORY	FLO4	PT42 PSHTAZ	CB -Q0 READY	NOT READY		0
7	1402-08-21 1:27:45:733 PM	ATF1Q2A1/ATF1Q2Q0/10	rPTD LABORATORY	FLO4	PT42 PSHTAZ	CB -Q0 POSITION INDICATION	INTERMEDIATE		0

#	Time Stamp	Index	Station	Bay	Device	Signal Name	Event State Text	Username	EventValue
1	1402-08-21 1:28:05:397 PM	ATF1Q1A1/ATF1Q1Q1/10	rPTD LABORATORY	FLO3	REF620 ABB	D5 -Q1 POSITION INDICATION	FAULTY		3
2	1402-08-21 1:27:40:257 PM	ATF1Q1A1/ATF1Q1Q0/10	rPTD LABORATORY	FLO3	REF620 ABB	CB -Q0 POSITION INDICATION	INTERMEDIATE		0
3	1402-08-21 1:27:40:253 PM	ATF1Q1A1/ATF1Q1Q9/10	rPTD LABORATORY	FLO3	REF620 ABB	D5 -Q9 POSITION INDICATION	INTERMEDIATE		0
4	1402-08-21 1:27:40:253 PM	ATF1Q1A1/ATF1Q1Q8/10	rPTD LABORATORY	FLO3	REF620 ABB	E5 -Q8 POSITION INDICATION	INTERMEDIATE		0
5	1402-08-21 1:26:53:100 PM	ATF1Q1A1/ATF1Q1Q1/10	rPTD LABORATORY	FLO3	REF620 ABB	D5 -Q1 POSITION INDICATION	INTERMEDIATE		0
6	1402-08-21 1:26:00:173 PM	ATF1Q1A1/ATF1Q1Q8/10	rPTD LABORATORY	FLO3	REF620 ABB	E5 -Q8 POSITION INDICATION	FAULTY		3
7	1402-08-21 1:24:42:937 PM	ATF1Q1A1/ATF1Q1Q9/10	rPTD LABORATORY	FLO3	REF620 ABB	D5 -Q9 POSITION INDICATION	FAULTY		3
8	1402-08-21 1:23:51:240 PM	SSS100/Alarms/Events/61	rPTD LABORATORY	FLO3	SSS100	CB -Q0 SP6 STGT OPERATED	ON		1
9	1402-08-21 1:23:51:237 PM	SSS100/Alarms/Events/51	rPTD LABORATORY	FLO3	SSS100	CB -Q0 LOCKOUT OPERATED	ON		1
10	1402-08-21 1:23:51:137 PM	SSS100/Alarms/Events/71	rPTD LABORATORY	FLO3	SSS100	CB -Q0 SPRING DISCHARGED	ON		1
11	1402-08-21 1:08:35:813 PM	ATF1Q1A1/SIGNALS/71	rPTD LABORATORY	FLO3	REF620 ABB	CB -Q0 SPRING DISCHARGED	ON		1
12	1402-08-21 12:52:41:310 PM	ATF1Q1A1/SIGNALS/51	rPTD LABORATORY	FLO3	REF620 ABB	CB -Q0 LOCKOUT OPERATED	ON		1

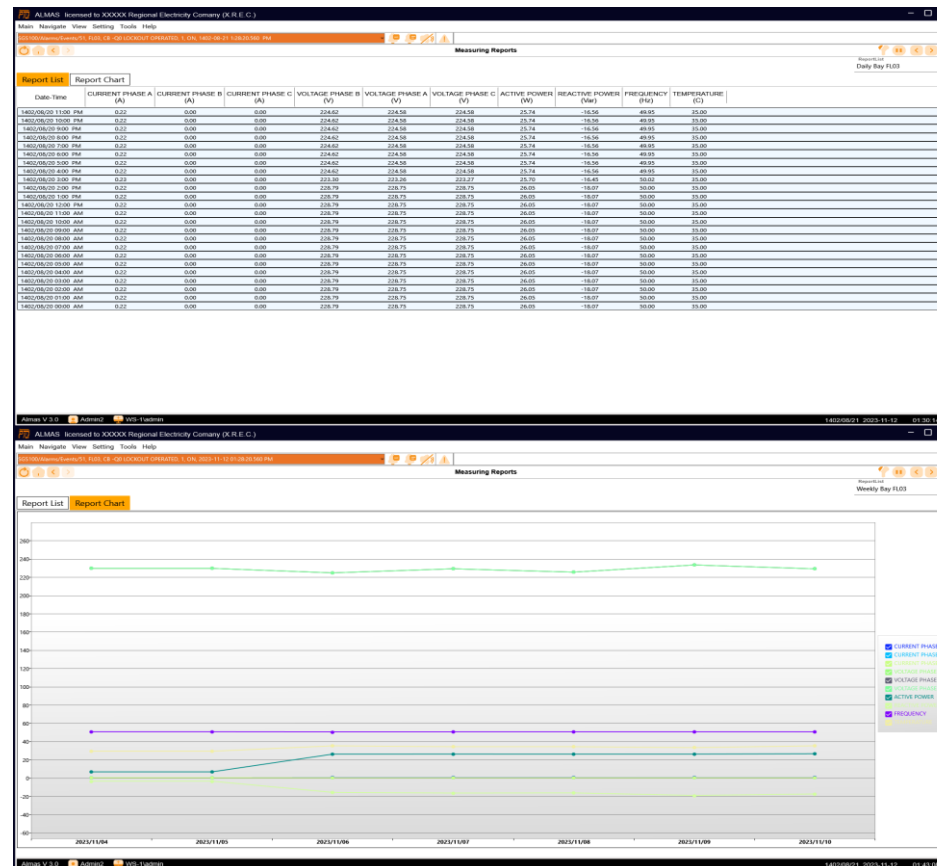
Almas V 3.0 Admin2 WS-1admin 1402/08/21 2023-11-12 01:28:50 PM

Cost saving

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Reports and Trends

- Measurement Reports (table and chart view) can be used for reporting:
 - * Energy (active, reactive)
 - * Current (for example bay level)
 - * Voltage (for example bay level)
 - * Frequency
 - * Temperature
 - * Other measured data
- Trends Display is used for trend analyses, as well as for showing measured values in curve



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Flexibility and Scalability

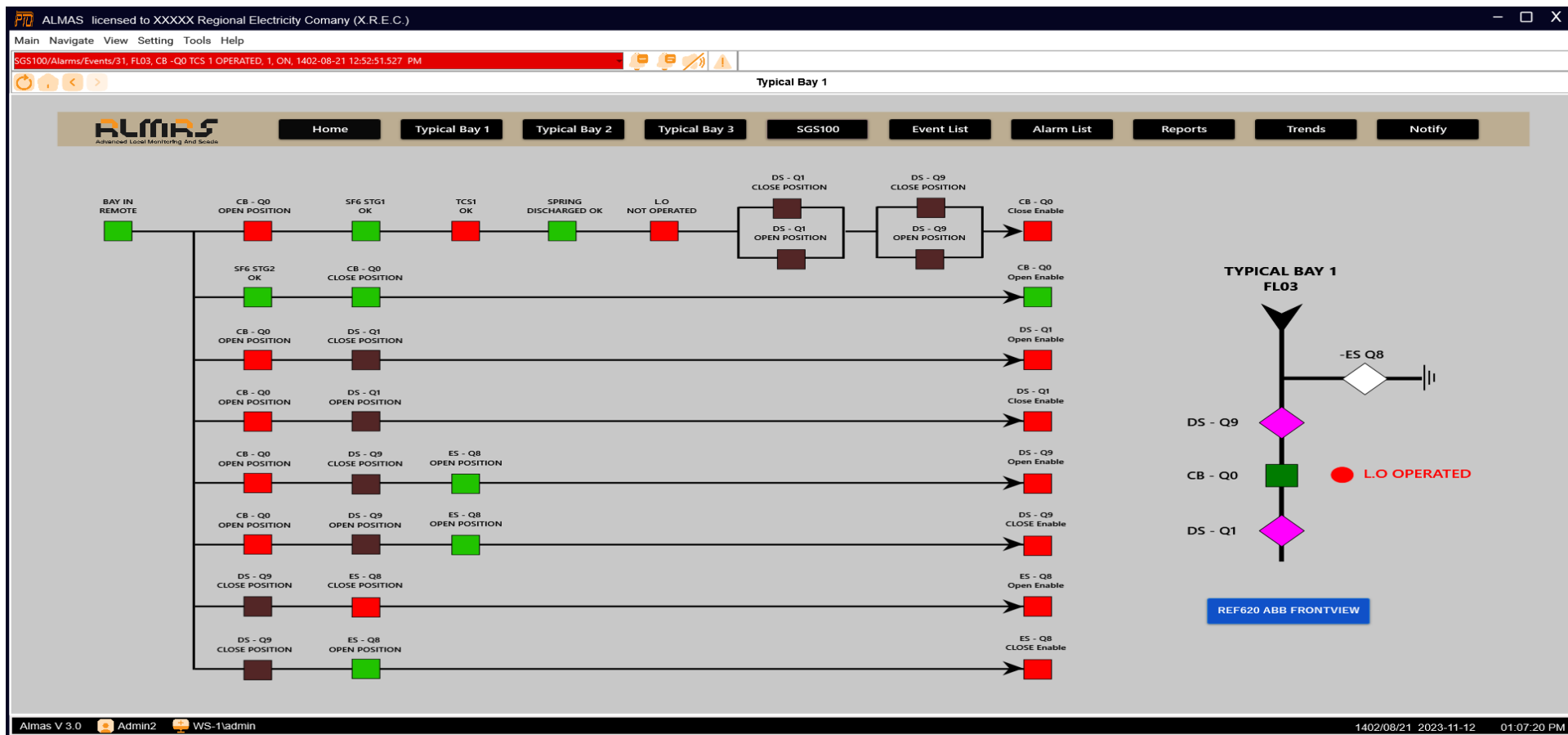
Features

Communication

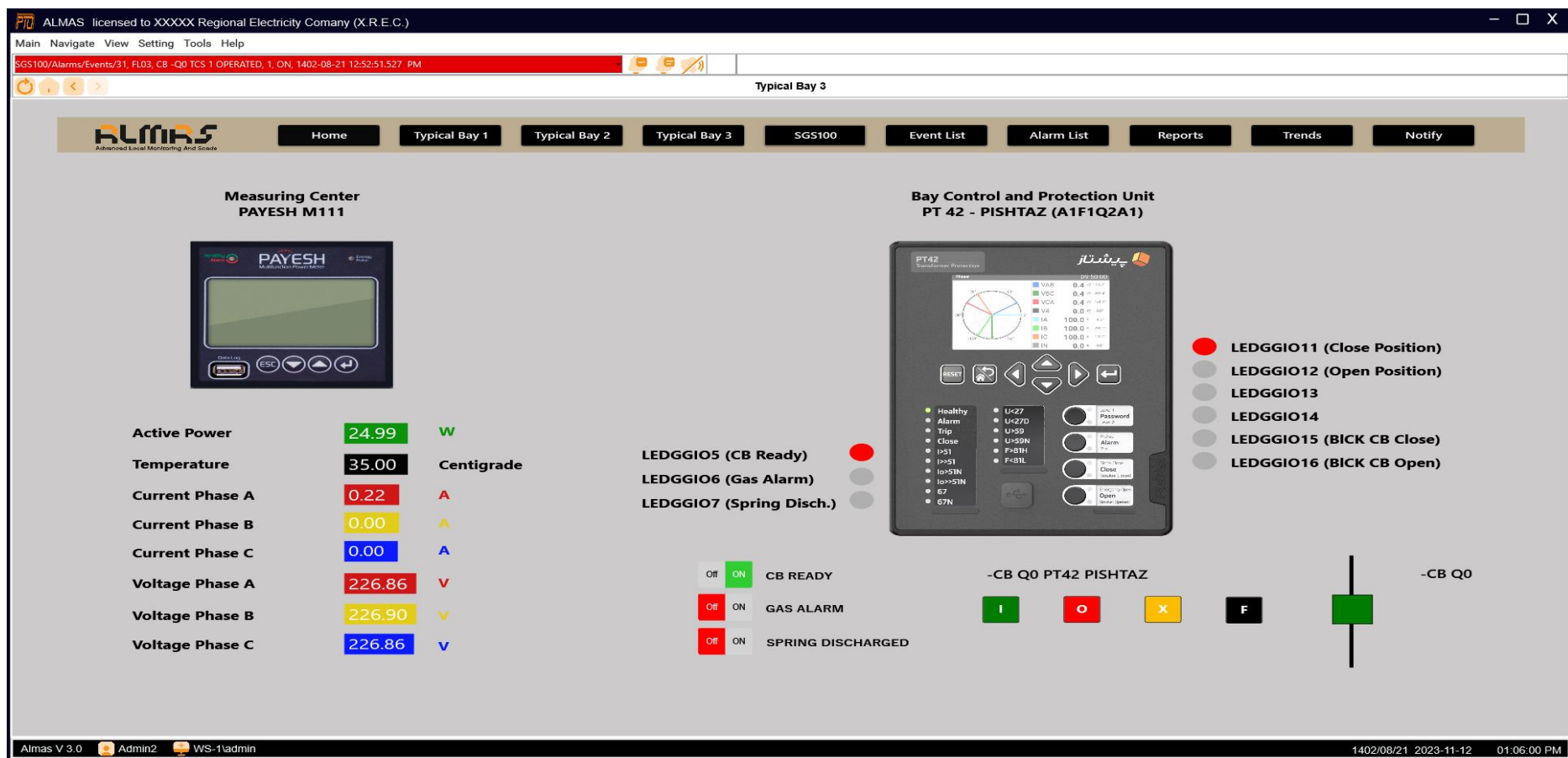
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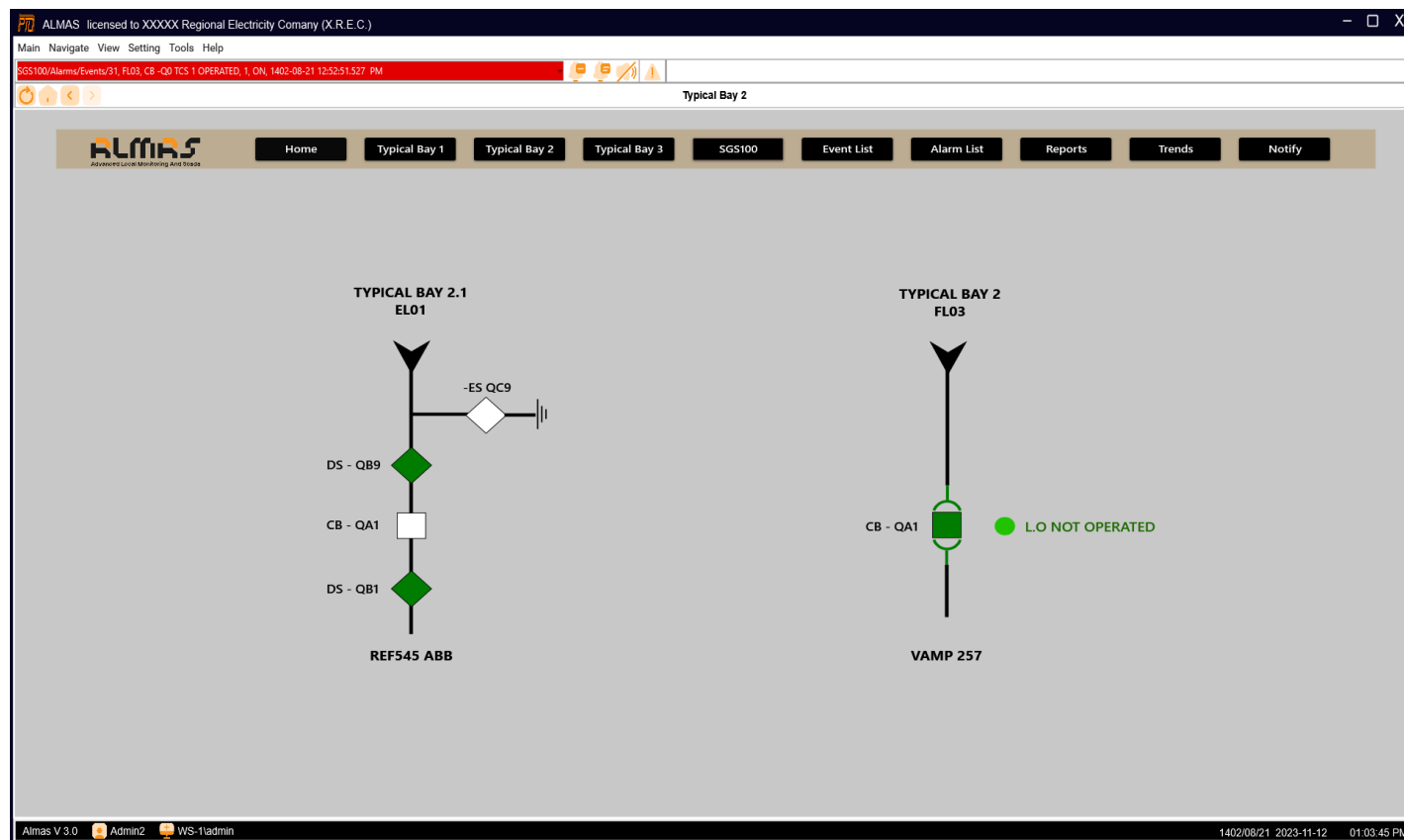
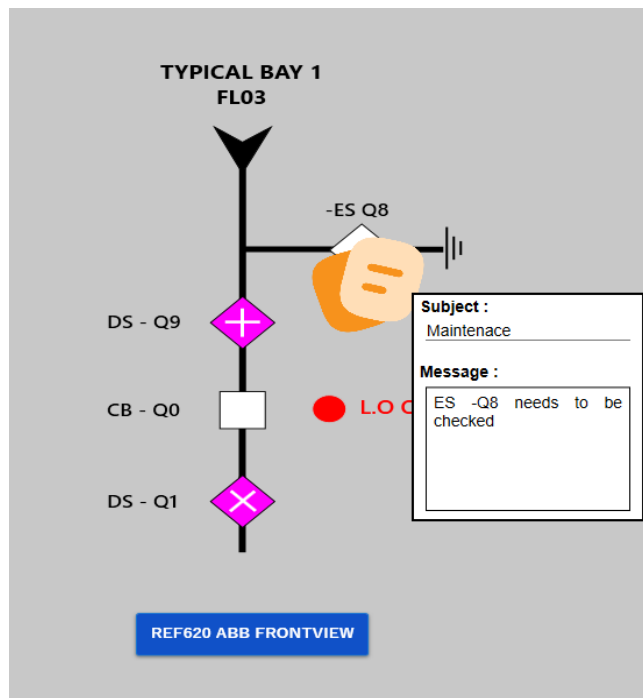
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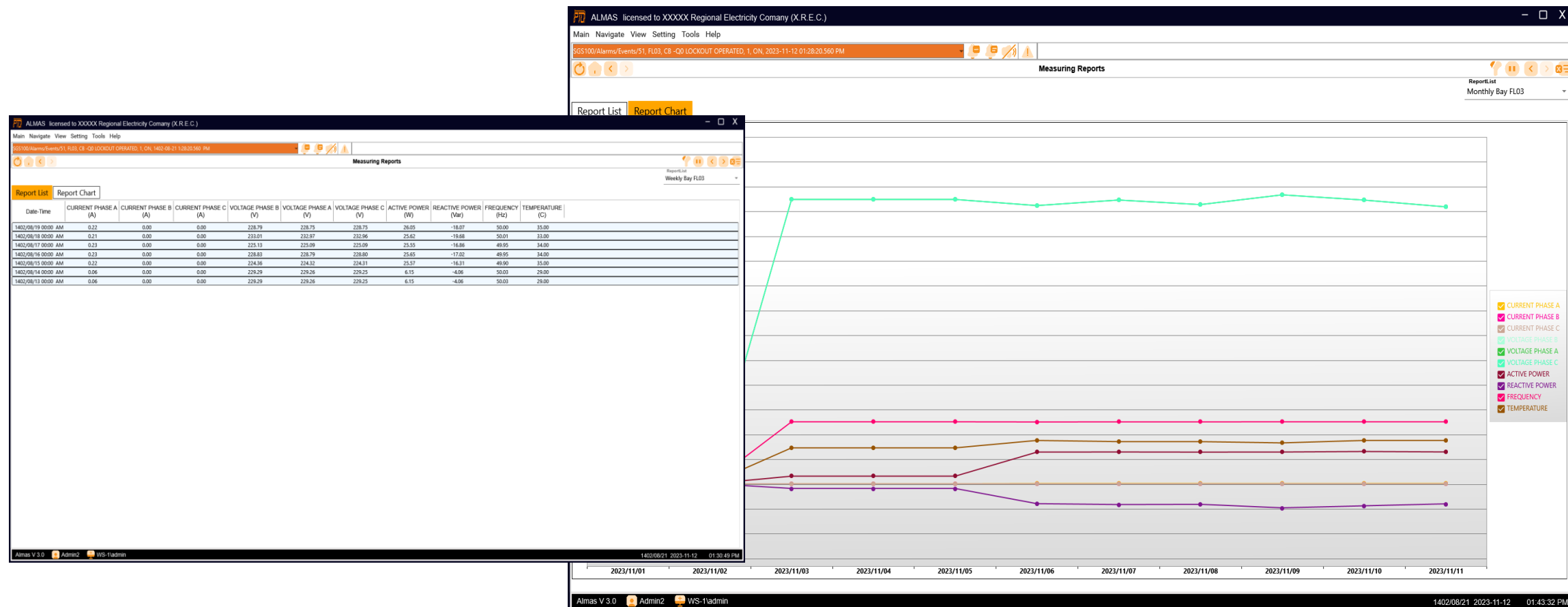
Application Picture



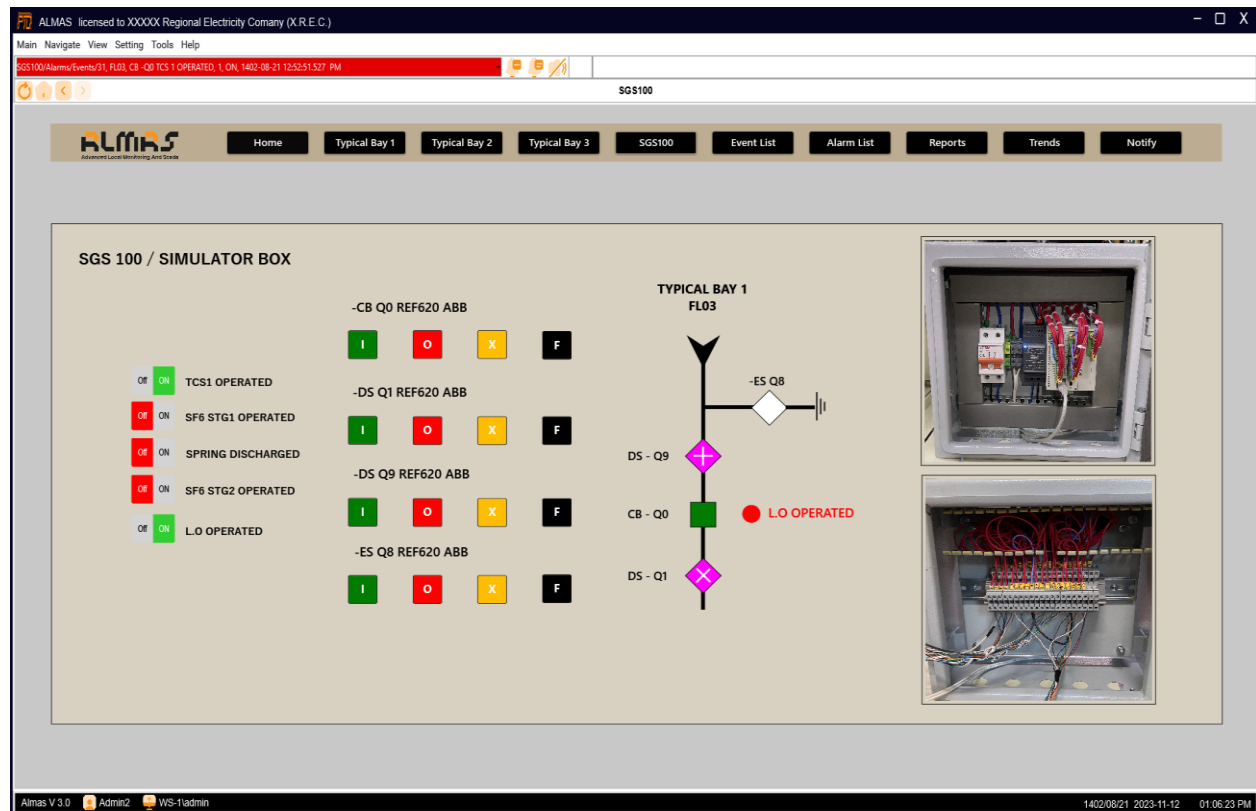
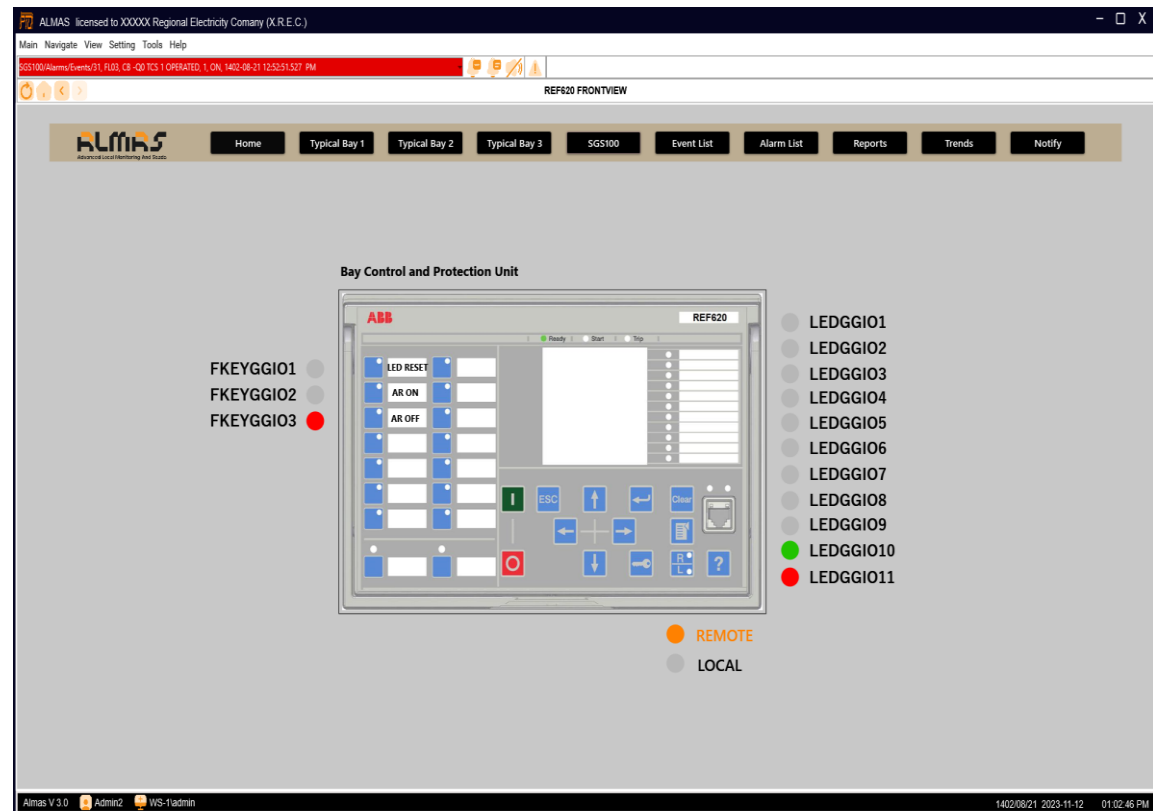
Application Picture



Application Picture



Application Picture



Novel Power Technologists Operation Company



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