ENERGY MANAGEMENT SOLUTIONS

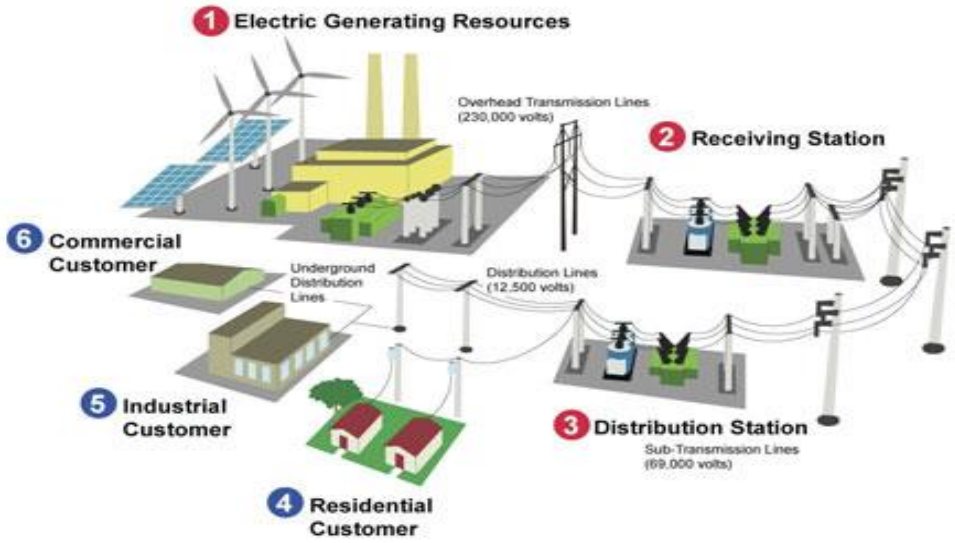
Products, Solutions & Technology

By

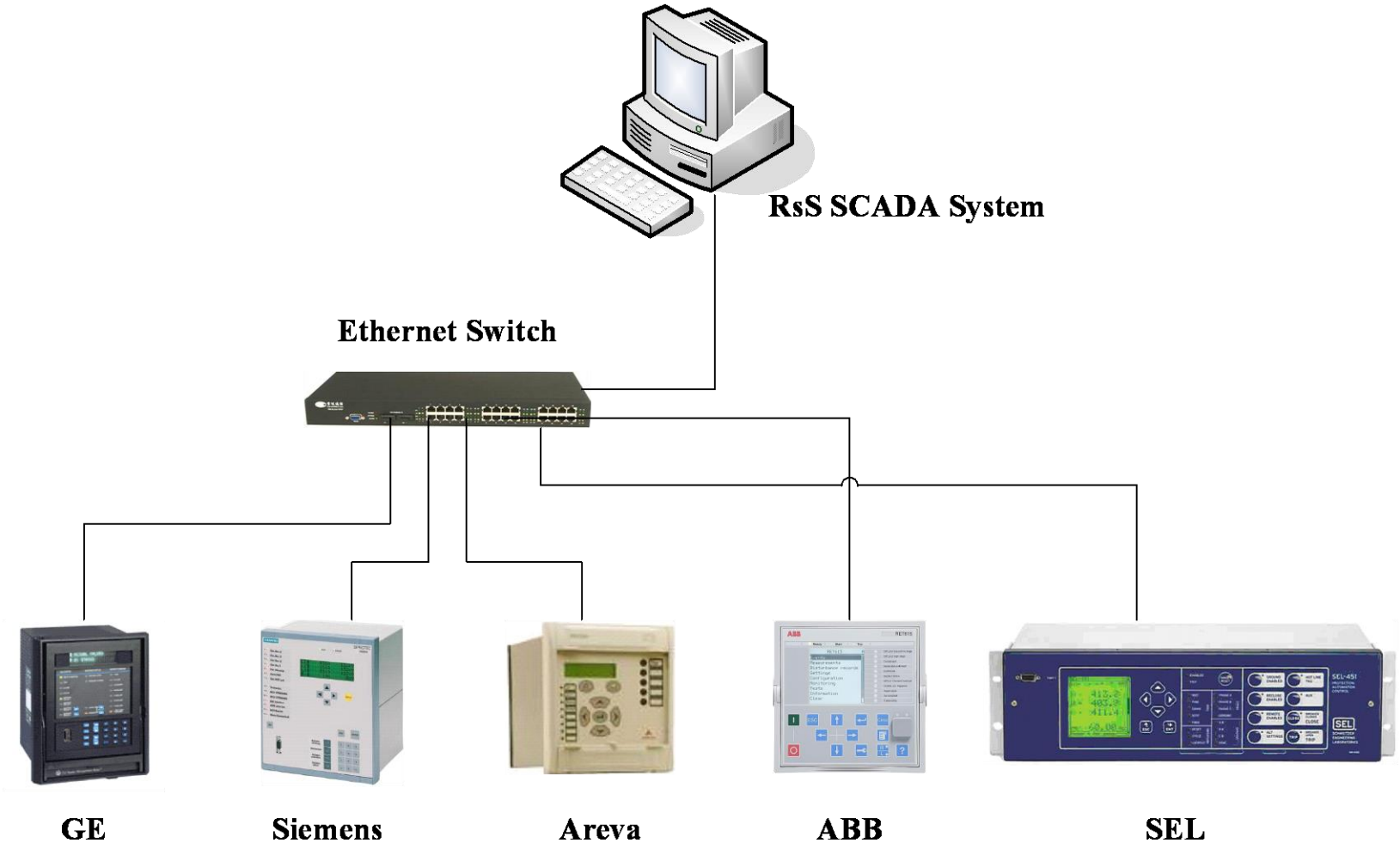
RBH Solutions Private Limited

RBH Introduction

- Provides solutions for SMART Communication / Interfaces and Automation Solutions
- Holds one the largest IPs in India for Communication Middleware used in automation industry
- 5 Indigenously developed different products to cover all End to End Requirements
- Example Smart Grid(1 – 6: Generation to Consumption)

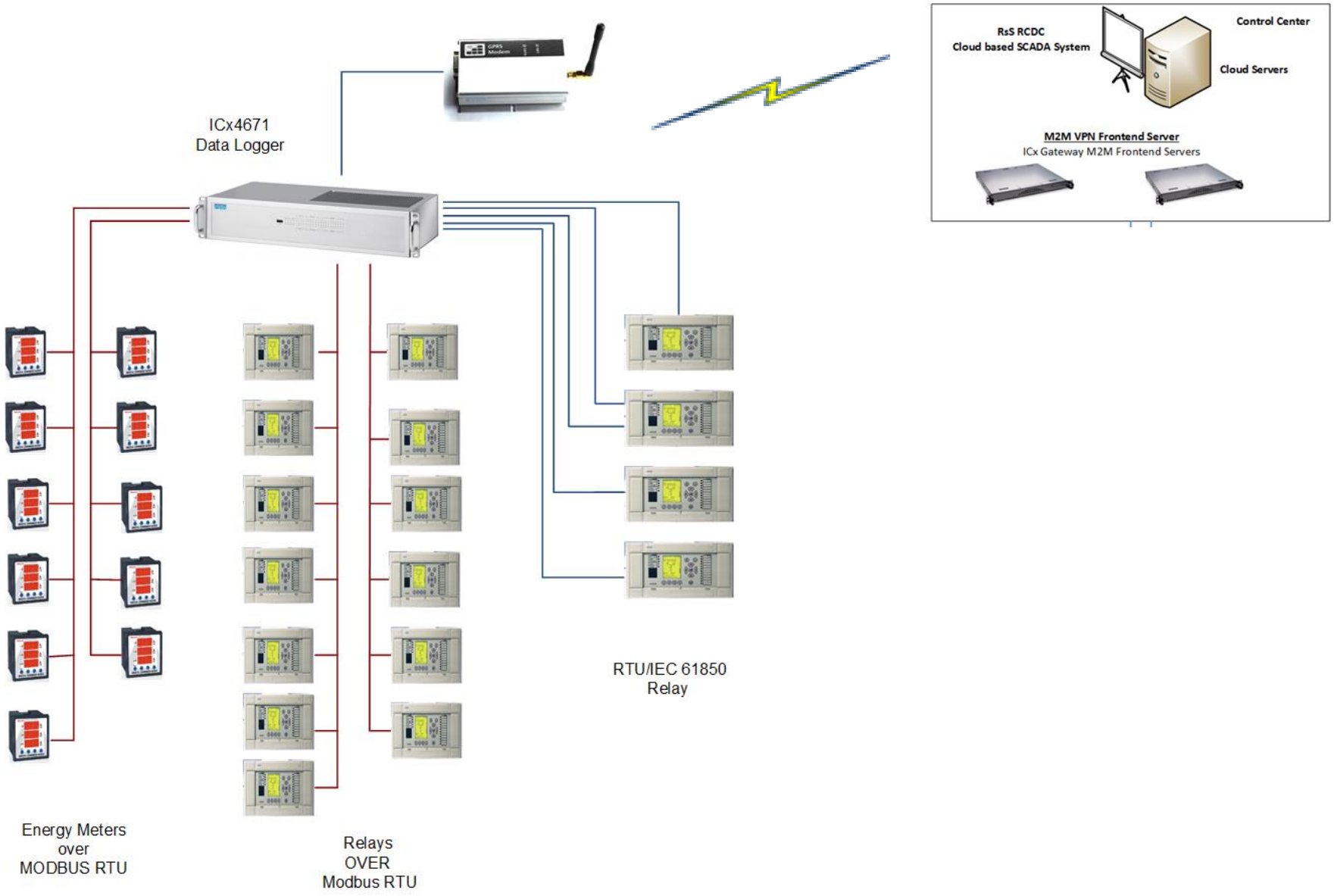


RBH Products: Vendor Independent

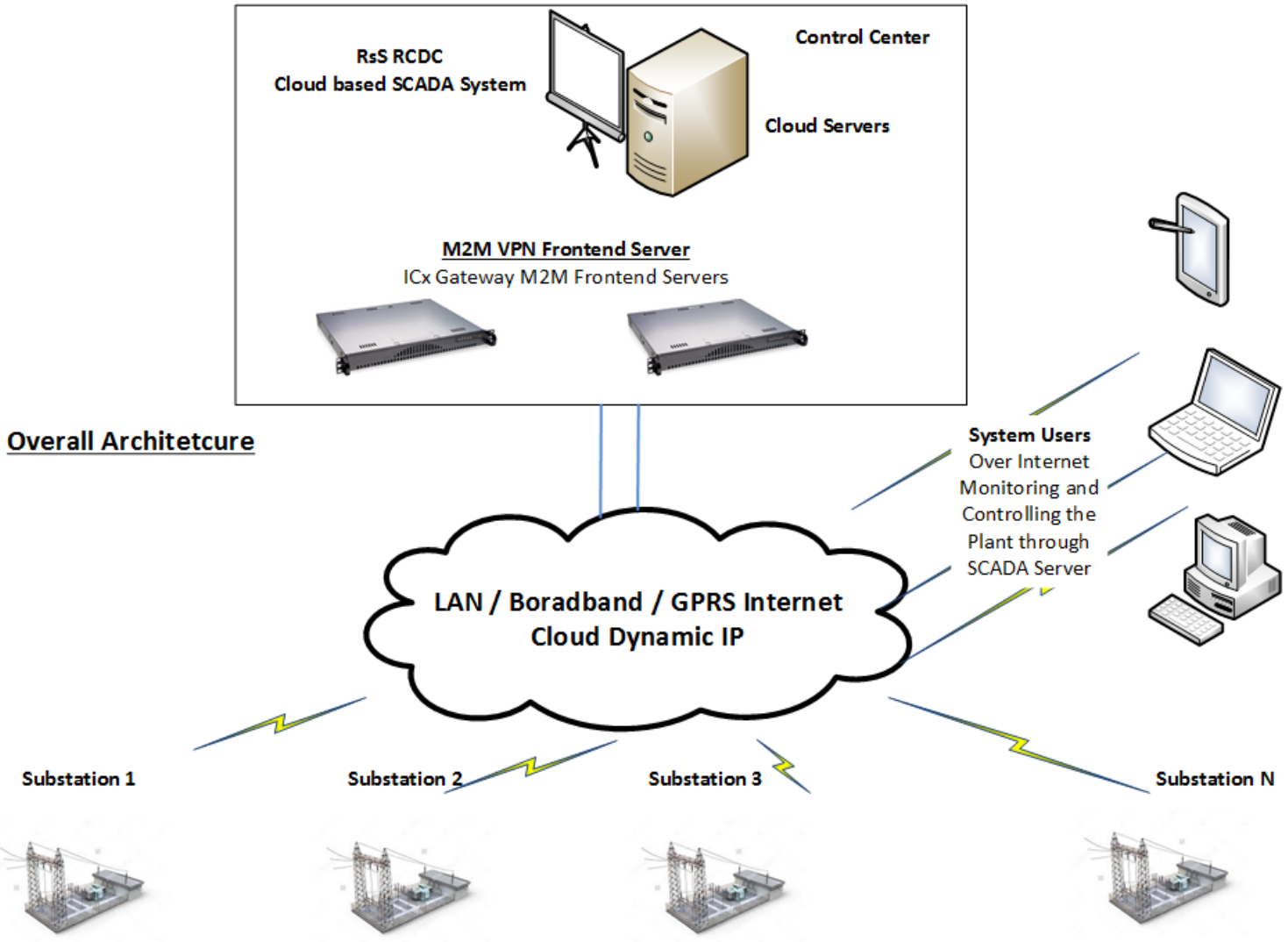


ALL IEDs / BCUs over IEC 61850 Protocol

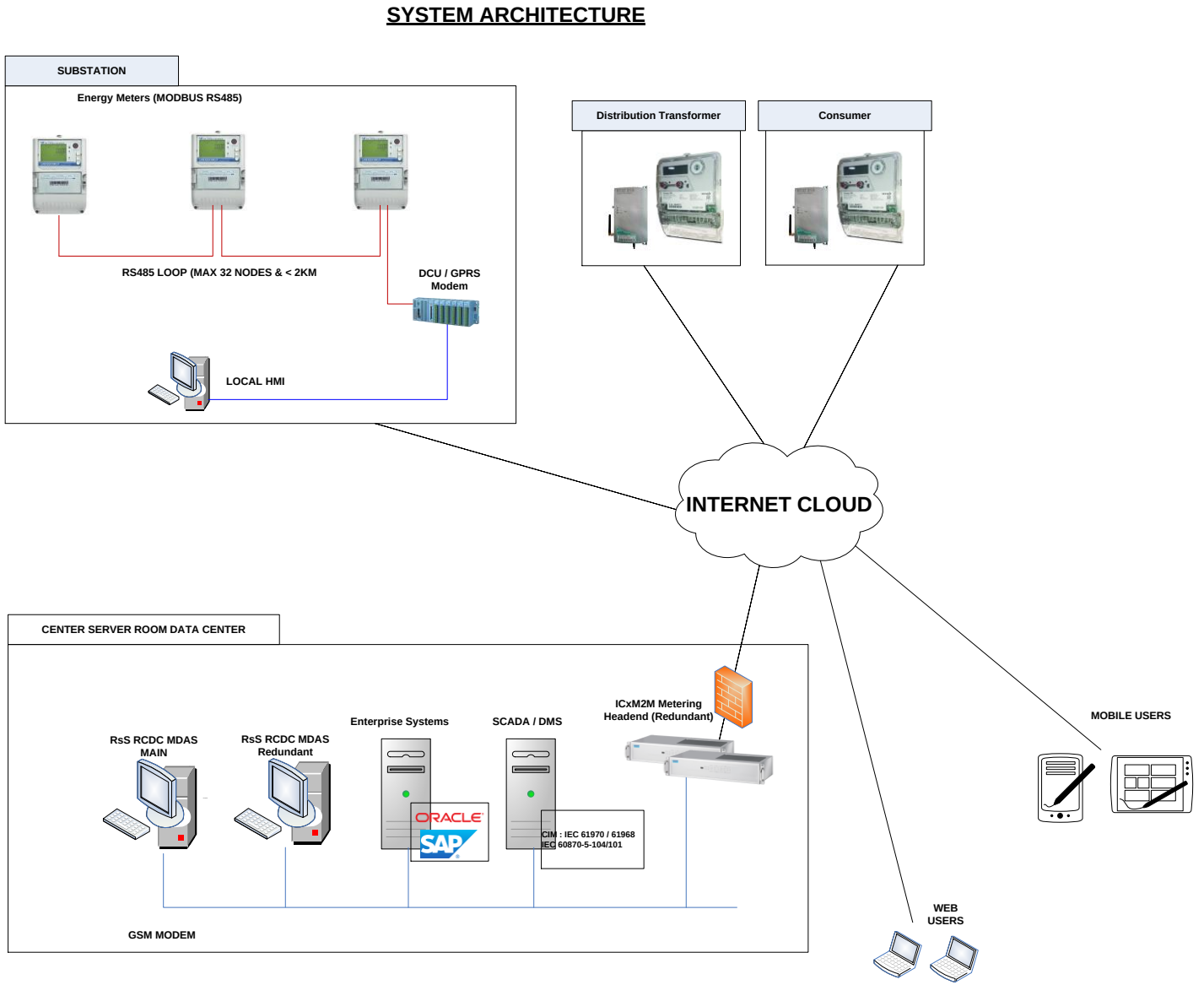
Substation Monitoring: New and Existing Substations



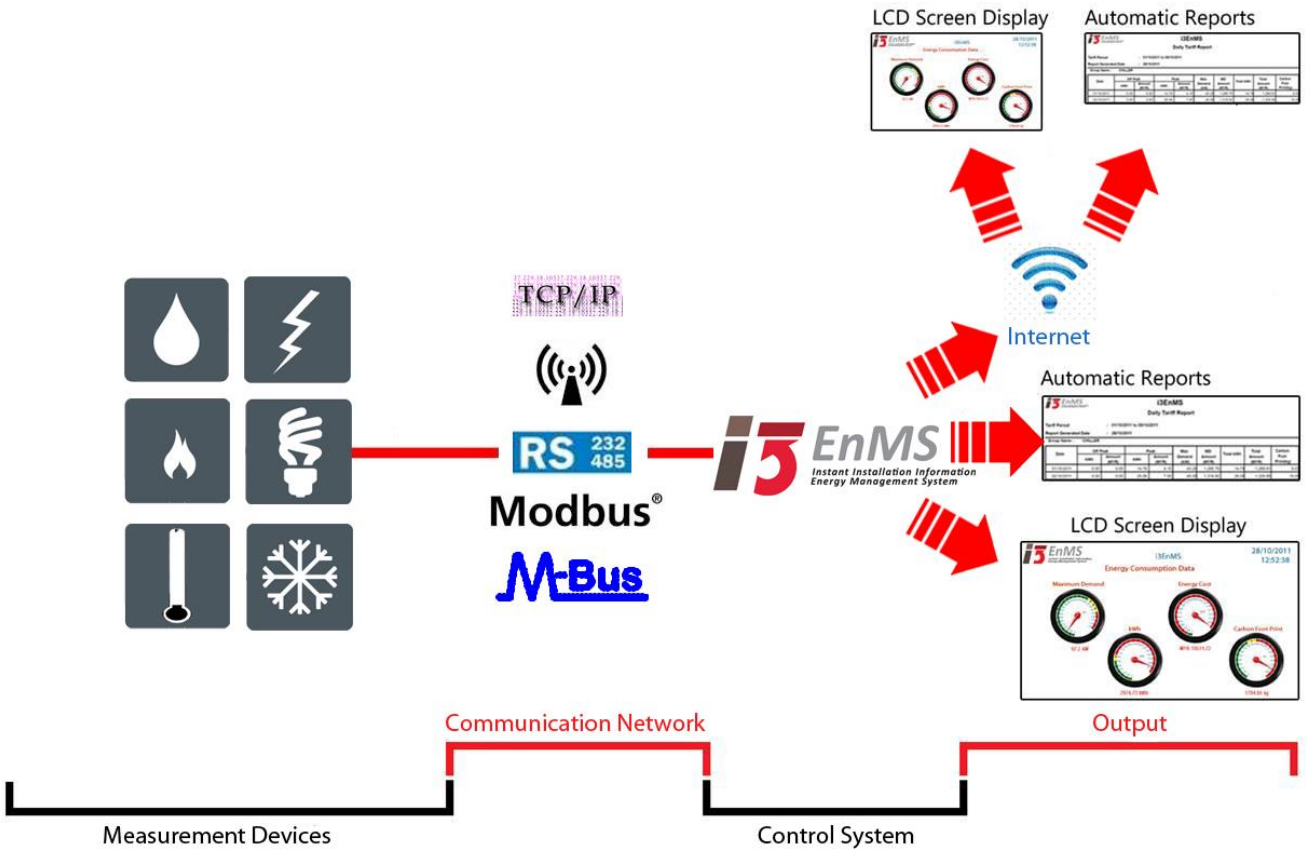
Central Monitoring System: Substation



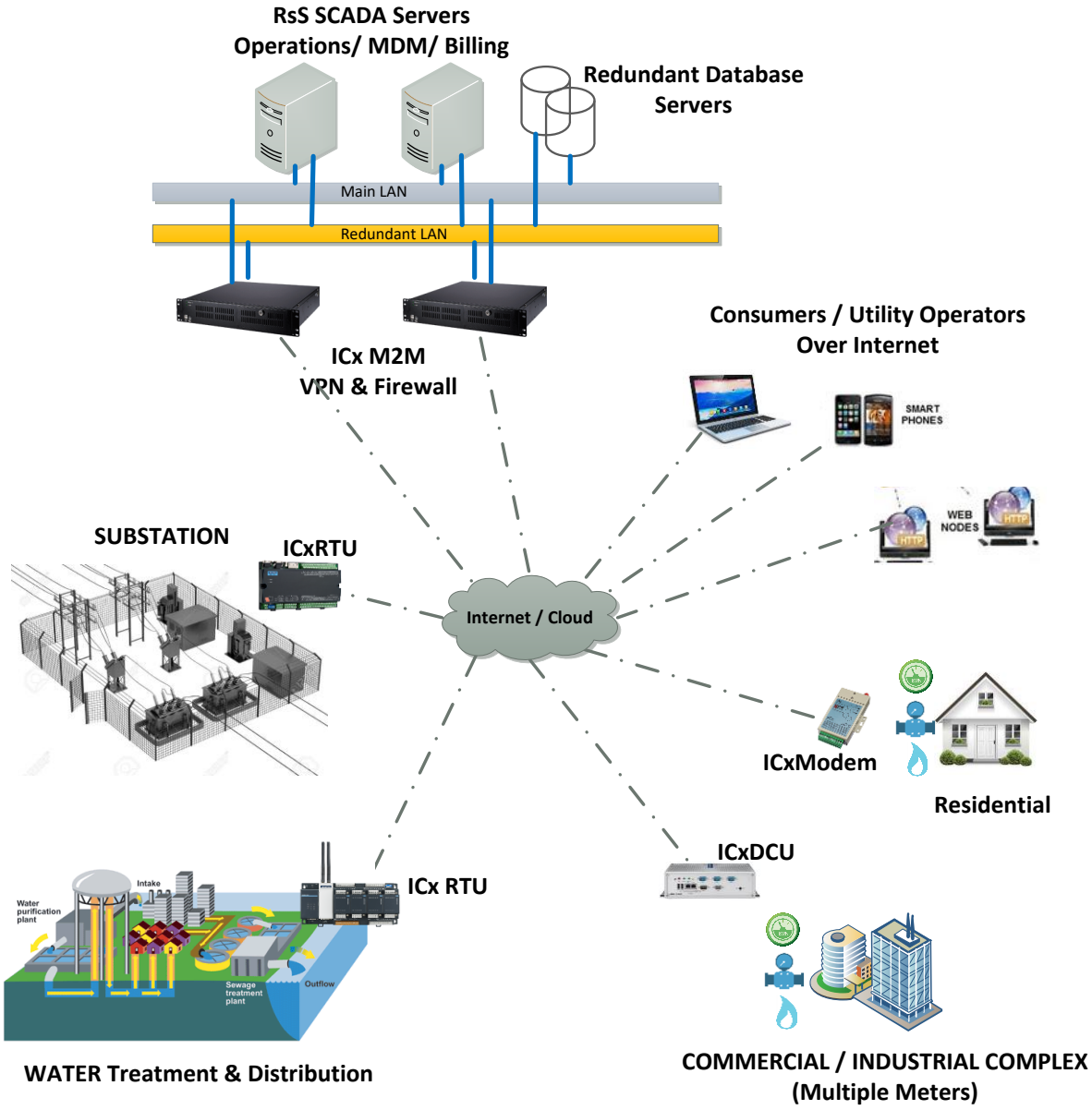
MDM: Architecture



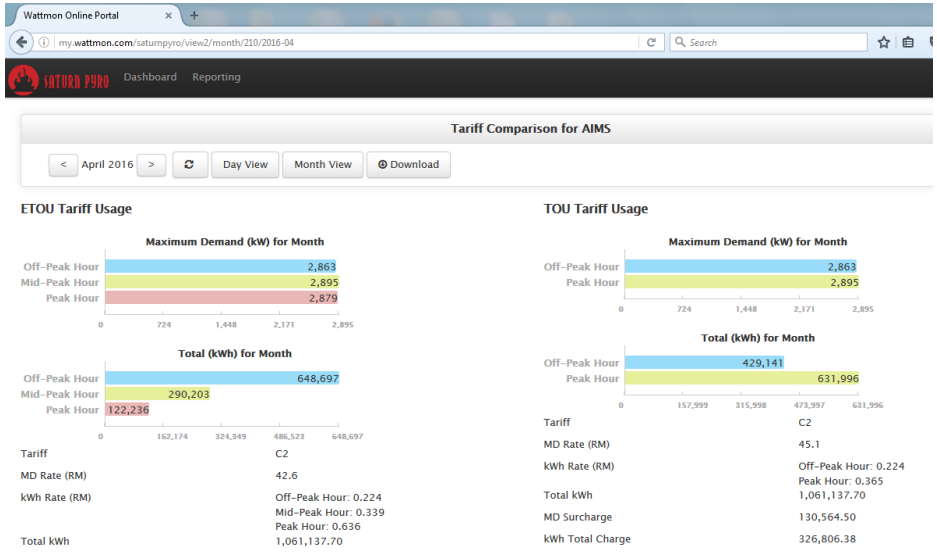
Energy Management System

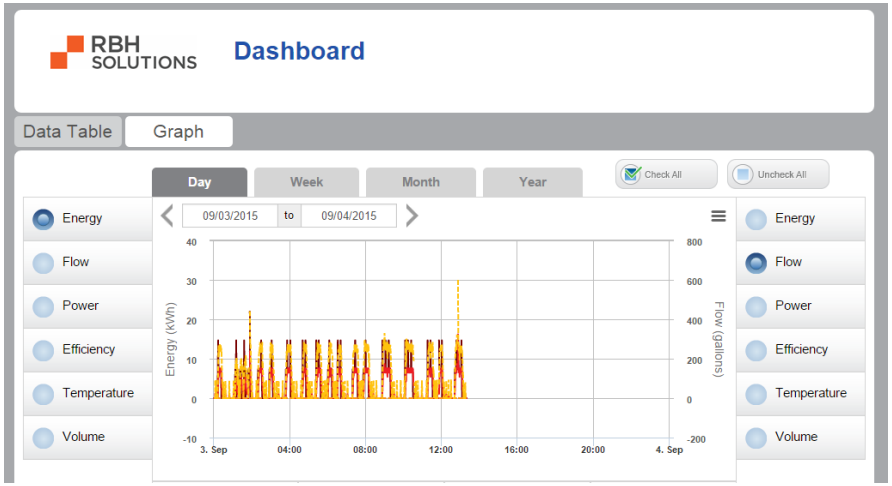


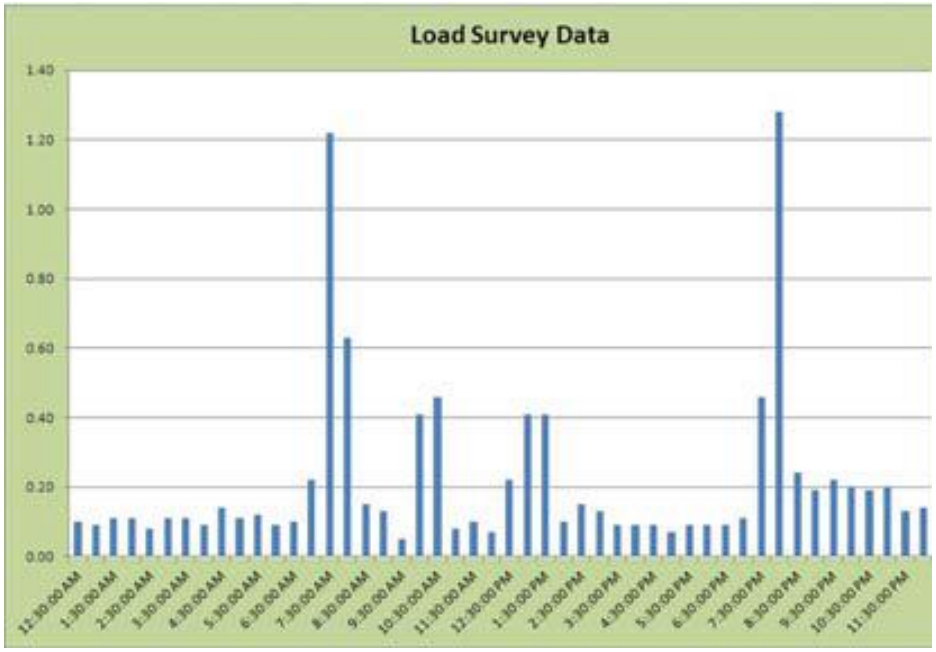
Central Monitoring System: All in One



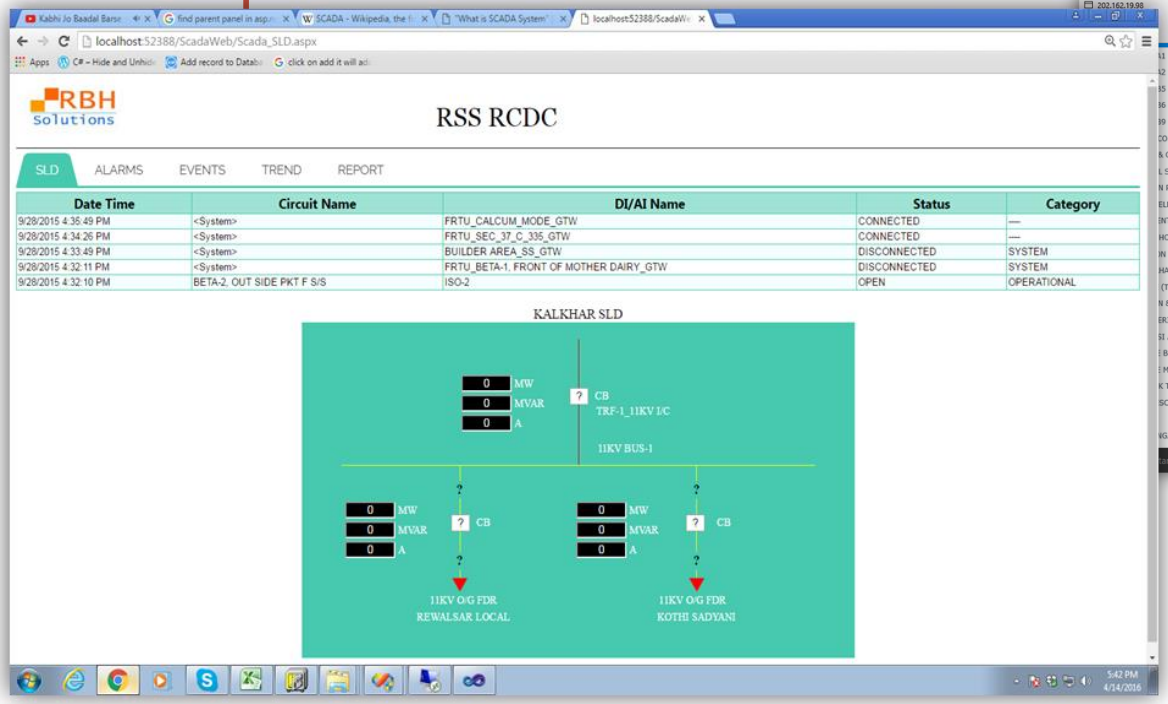
Sample WEB Views

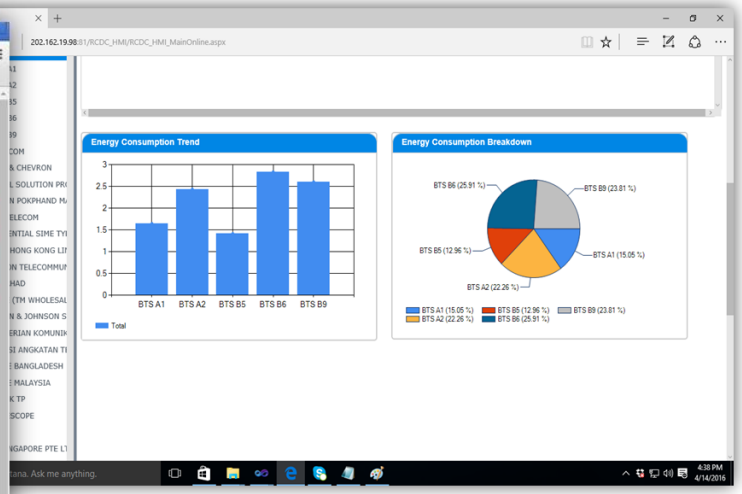


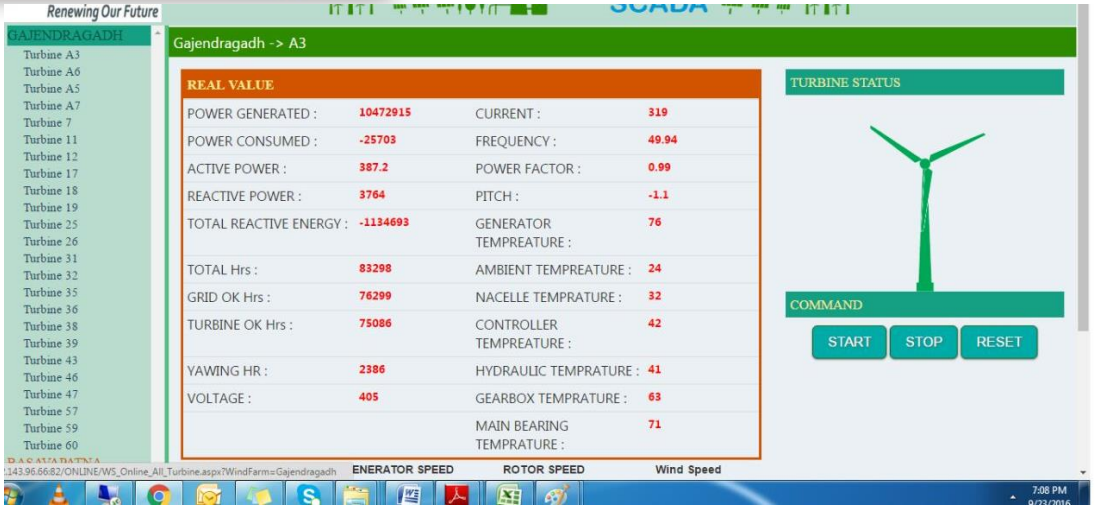




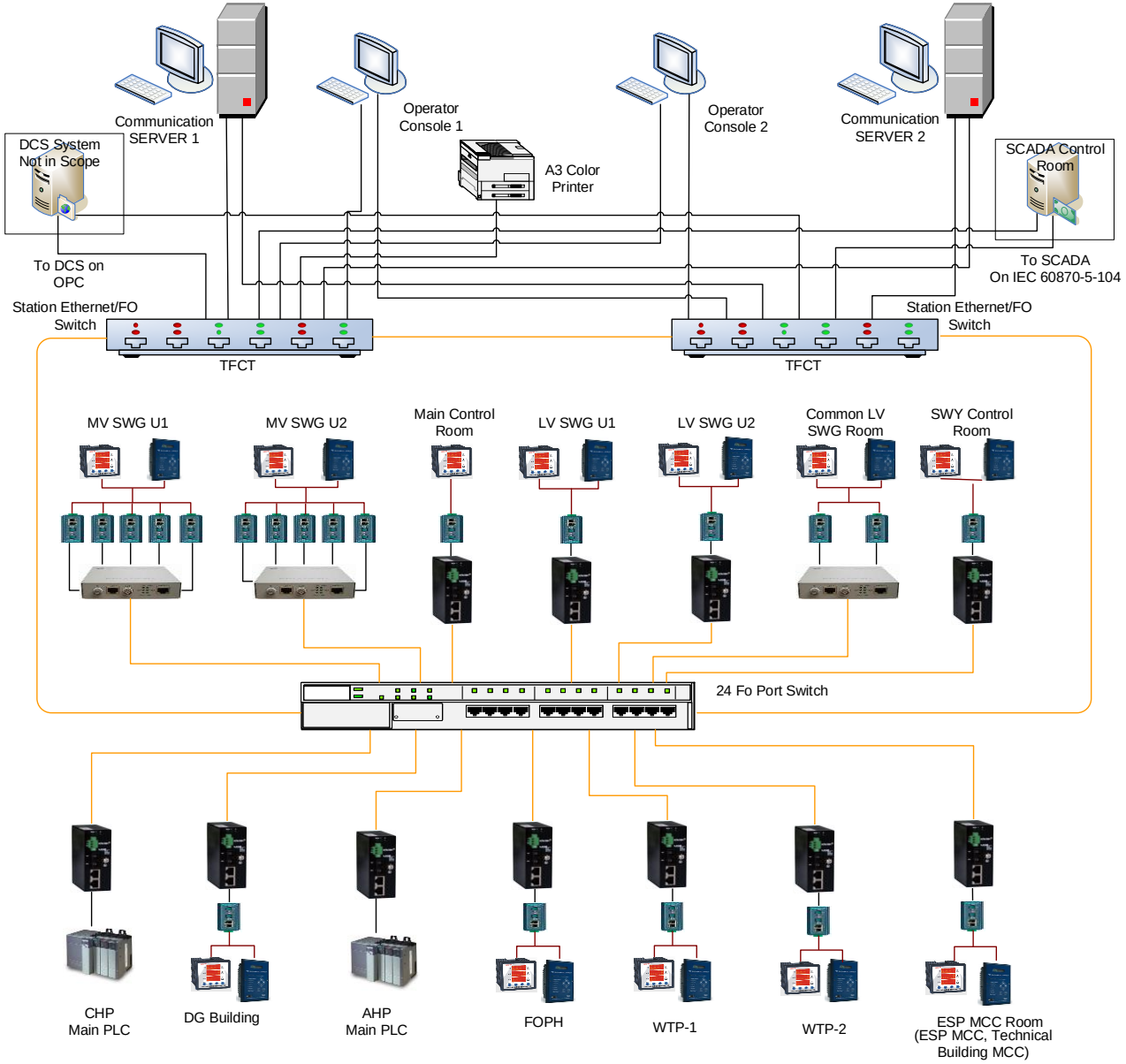
Sample WEB Views



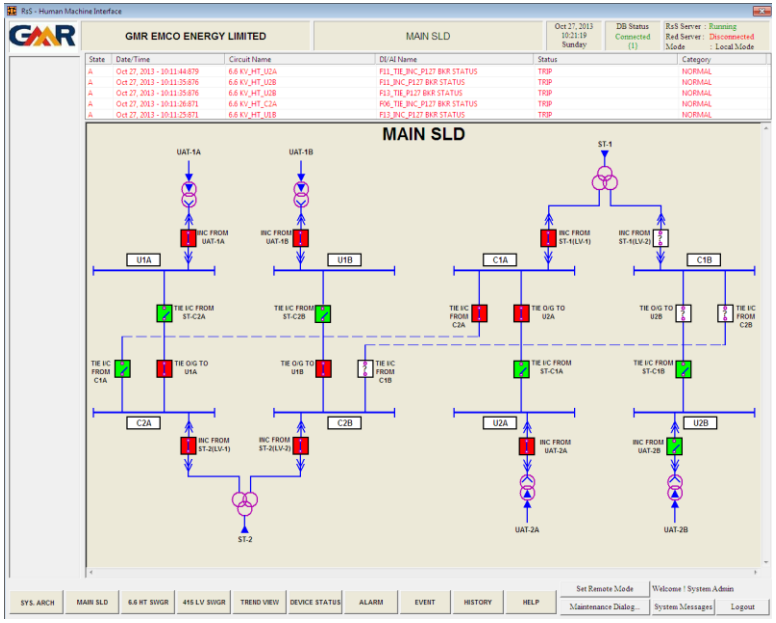


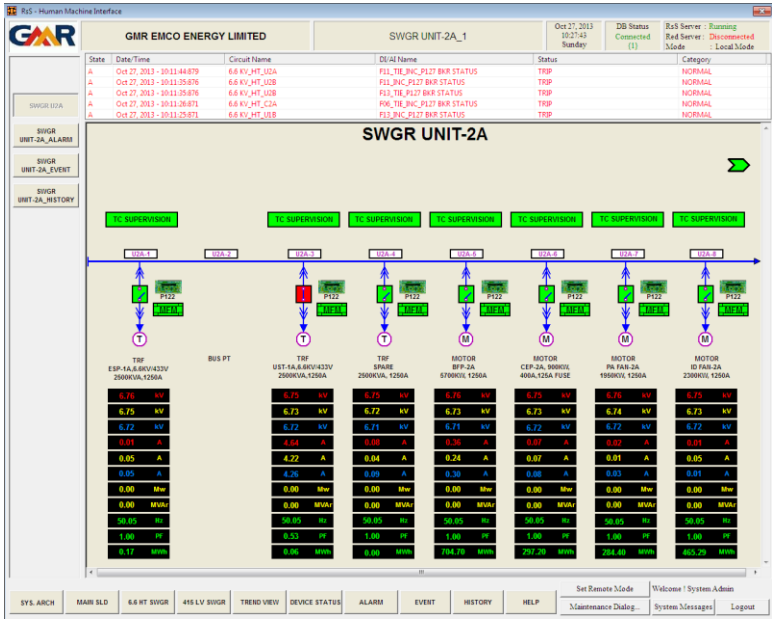


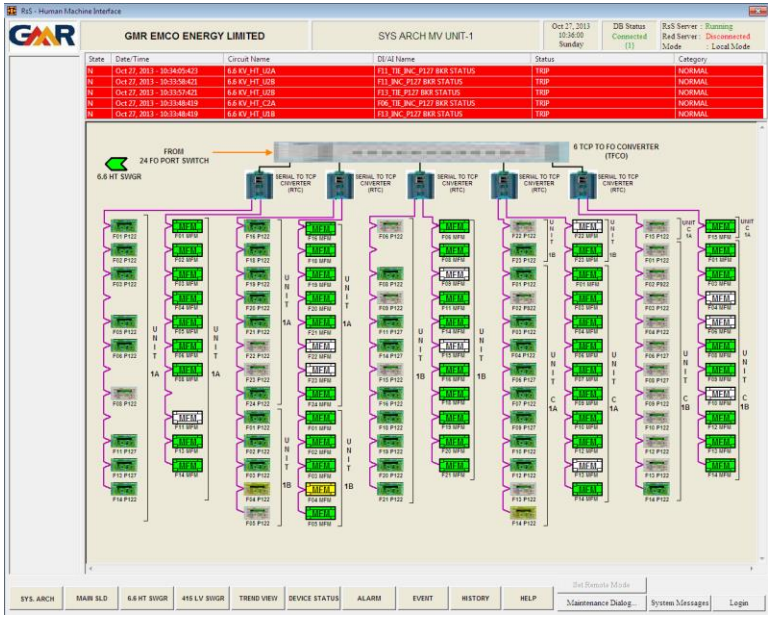
EMS Sample System Architecture

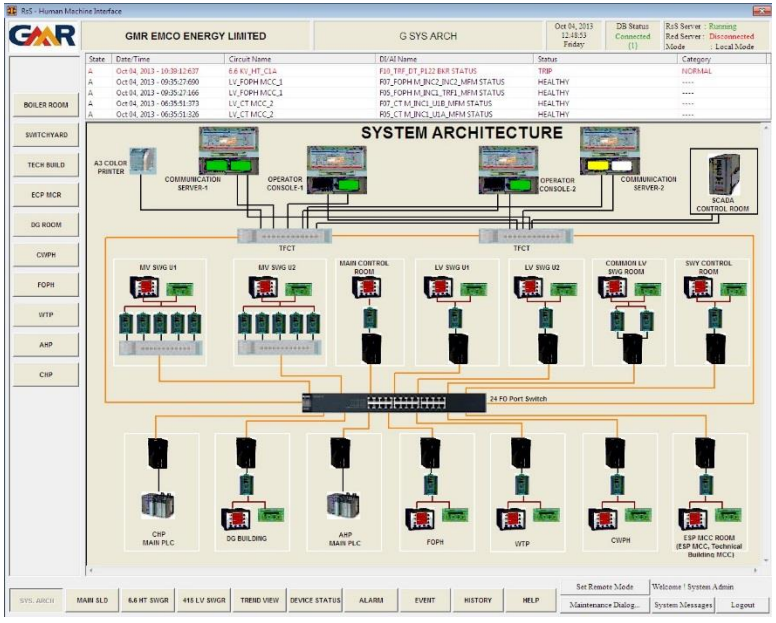


Sample Key System Views

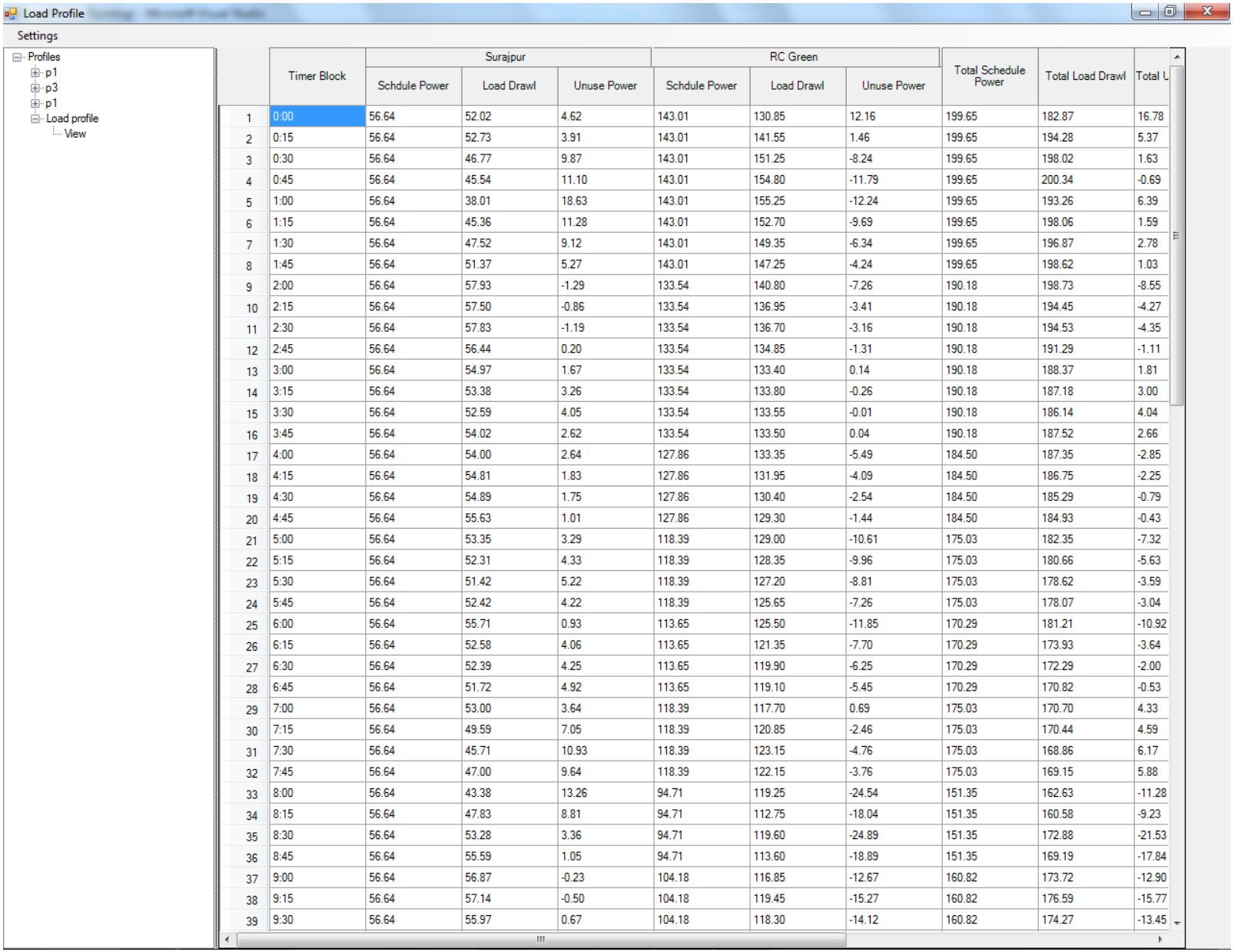








EMS Application Views



	Timer Block	Surajpur			RC Green			Total Schedule Power	Total Load Drawl	Total L
		Schdule Power	Load Drawl	Unuse Power	Schdule Power	Load Drawl	Unuse Power			
1	0:00	56.64	52.02	4.62	143.01	130.85	12.16	199.65	182.87	16.78
2	0:15	56.64	52.73	3.91	143.01	141.55	1.46	199.65	194.28	5.37
3	0:30	56.64	46.77	9.87	143.01	151.25	-8.24	199.65	198.02	1.63
4	0:45	56.64	45.54	11.10	143.01	154.80	-11.79	199.65	200.34	-0.69
5	1:00	56.64	38.01	18.63	143.01	155.25	-12.24	199.65	193.26	6.39
6	1:15	56.64	45.36	11.28	143.01	152.70	-9.69	199.65	198.06	1.59
7	1:30	56.64	47.52	9.12	143.01	149.35	-6.34	199.65	196.87	2.78
8	1:45	56.64	51.37	5.27	143.01	147.25	-4.24	199.65	198.62	1.03
9	2:00	56.64	57.93	-1.29	133.54	140.80	-7.26	190.18	198.73	-8.55
10	2:15	56.64	57.50	-0.86	133.54	136.95	-3.41	190.18	194.45	-4.27
11	2:30	56.64	57.83	-1.19	133.54	136.70	-3.16	190.18	194.53	-4.35
12	2:45	56.64	56.44	0.20	133.54	134.85	-1.31	190.18	191.29	-1.11
13	3:00	56.64	54.97	1.67	133.54	133.40	0.14	190.18	188.37	1.81
14	3:15	56.64	53.38	3.26	133.54	133.80	-0.26	190.18	187.18	3.00
15	3:30	56.64	52.59	4.05	133.54	133.55	-0.01	190.18	186.14	4.04
16	3:45	56.64	54.02	2.62	133.54	133.50	0.04	190.18	187.52	2.66
17	4:00	56.64	54.00	2.64	127.86	133.35	-5.49	184.50	187.35	-2.85
18	4:15	56.64	54.81	1.83	127.86	131.95	-4.09	184.50	186.75	-2.25
19	4:30	56.64	54.89	1.75	127.86	130.40	-2.54	184.50	185.29	-0.79
20	4:45	56.64	55.63	1.01	127.86	129.30	-1.44	184.50	184.93	-0.43
21	5:00	56.64	53.35	3.29	118.39	129.00	-10.61	175.03	182.35	-7.32
22	5:15	56.64	52.31	4.33	118.39	128.35	-9.96	175.03	180.66	-5.63
23	5:30	56.64	51.42	5.22	118.39	127.20	-8.81	175.03	178.62	-3.59
24	5:45	56.64	52.42	4.22	118.39	125.65	-7.26	175.03	178.07	-3.04
25	6:00	56.64	55.71	0.93	113.65	125.50	-11.85	170.29	181.21	-10.92
26	6:15	56.64	52.58	4.06	113.65	121.35	-7.70	170.29	173.93	-3.64
27	6:30	56.64	52.39	4.25	113.65	119.90	-6.25	170.29	172.29	-2.00
28	6:45	56.64	51.72	4.92	113.65	119.10	-5.45	170.29	170.82	-0.53
29	7:00	56.64	53.00	3.64	118.39	117.70	0.69	175.03	170.70	4.33
30	7:15	56.64	49.59	7.05	118.39	120.85	-2.46	175.03	170.44	4.59
31	7:30	56.64	45.71	10.93	118.39	123.15	-4.76	175.03	168.86	6.17
32	7:45	56.64	47.00	9.64	118.39	122.15	-3.76	175.03	169.15	5.88
33	8:00	56.64	43.38	13.26	94.71	119.25	-24.54	151.35	162.63	-11.28
34	8:15	56.64	47.83	8.81	94.71	112.75	-18.04	151.35	160.58	-9.23
35	8:30	56.64	53.28	3.36	94.71	119.60	-24.89	151.35	172.88	-21.53
36	8:45	56.64	55.59	1.05	94.71	113.60	-18.89	151.35	169.19	-17.84
37	9:00	56.64	56.87	-0.23	104.18	116.85	-12.67	160.82	173.72	-12.90
38	9:15	56.64	57.14	-0.50	104.18	119.45	-15.27	160.82	176.59	-15.77
39	9:30	56.64	55.97	0.67	104.18	118.30	-14.12	160.82	174.27	-13.45

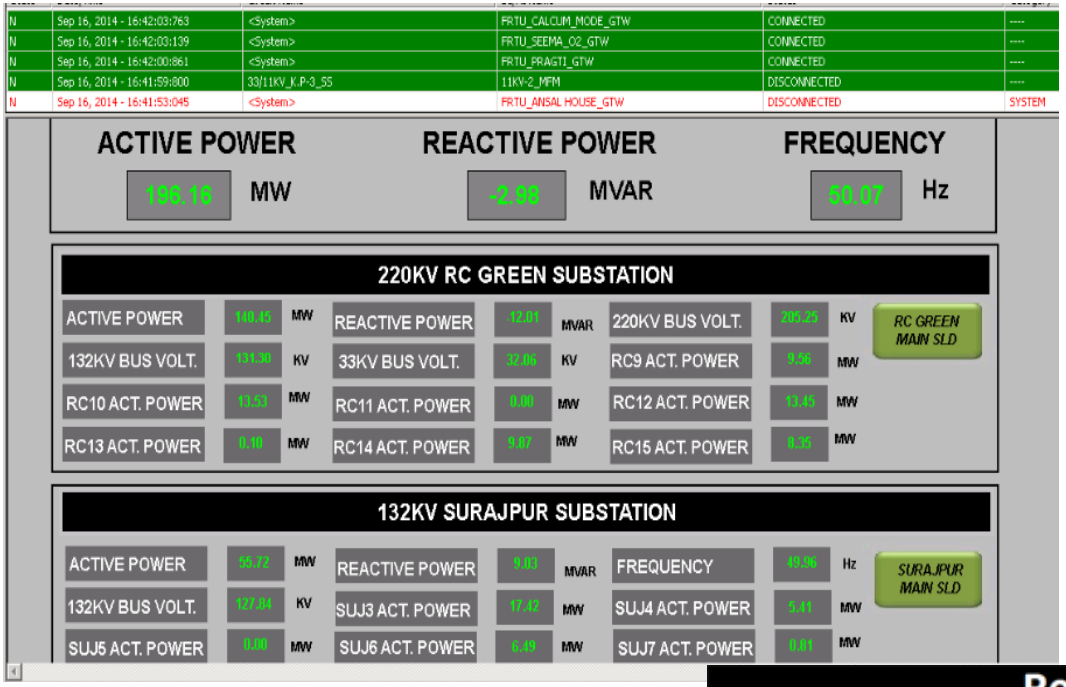
EMS Report Views

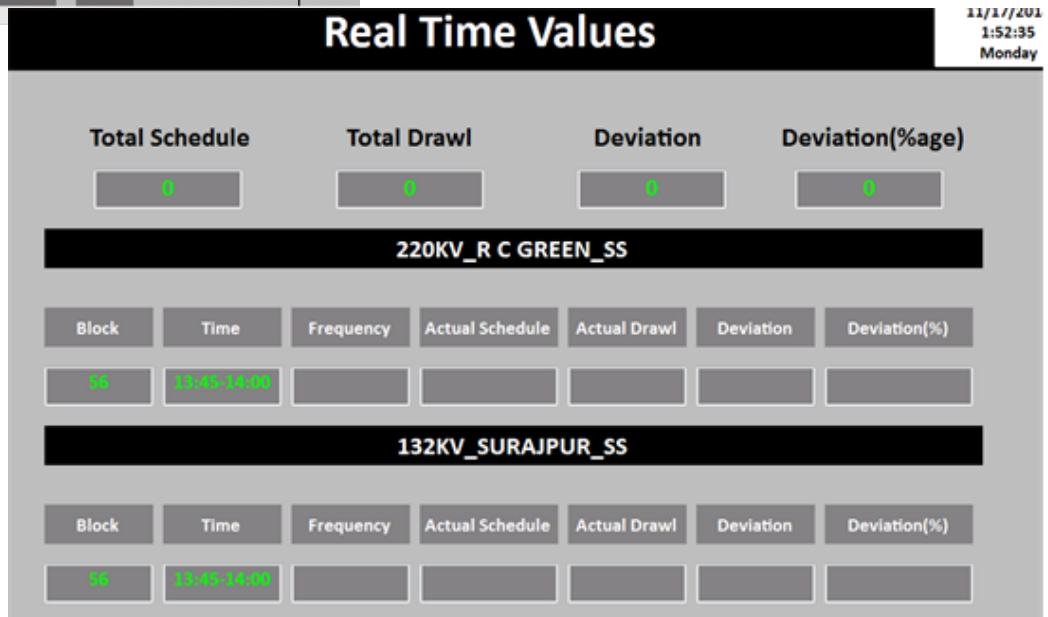
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Date:16/06/14														
2															
3		Surajpur			RC Green										
4	Timer Block	Schedule Power	Load Drawl	Unuse Power	Schedule Power	Load Drawl	Unuse Power	Total Schedule Power	Total Load Drawl	Unuse Power	Shut down	Breakdown		Unrestricted Load	
5												33 KV	11KV		
6															
7	0:00	56.64	52.02	4.62	143.01	130.85	12.16	199.65	182.87	16.78	0	0	0	182.87	
8	0:15	56.64	52.73	3.91	143.01	141.55	1.46	199.65	194.28	5.37	0	0	0	194.28	
9	0:30	56.64	46.77	9.87	143.01	151.25	-8.24	199.65	198.02	1.63	0	3	0	201.02	
10	0:45	56.64	45.54	11.10	143.01	154.80	-11.79	199.65	200.34	-0.69	0	3	0	203.34	
11	1:00	56.64	38.01	18.63	143.01	155.25	-12.24	199.65	193.26	6.39	0	8	0	201.26	
12	1:15	56.64	45.36	11.28	143.01	152.70	-9.69	199.65	198.06	1.59	0	3	0	201.06	
13	1:30	56.64	47.52	9.12	143.01	149.35	-6.34	199.65	196.87	2.78	0	3	0	199.87	
14	1:45	56.64	51.37	5.27	143.01	147.25	-4.24	199.65	198.62	1.03	0	3	0	201.62	
15	2:00	56.64	57.93	-1.29	133.54	140.80	-7.26	190.18	198.73	-8.55	0	3	0	201.73	
16	2:15	56.64	57.50	-0.86	133.54	136.95	-3.41	190.18	194.45	-4.27	0	3	0	197.45	
17	2:30	56.64	57.83	-1.19	133.54	136.70	-3.16	190.18	194.53	-4.35	0	3	0	197.53	
18	2:45	56.64	56.44	0.20	133.54	134.85	-1.31	190.18	191.29	-1.11	0	3	0	194.29	
19	3:00	56.64	54.97	1.67	133.54	133.40	0.14	190.18	188.37	1.81	0	3	0	191.37	
20	3:15	56.64	53.38	3.26	133.54	133.80	-0.26	190.18	187.18	3.00	0	3	0	190.18	
21	3:30	56.64	52.59	4.05	133.54	133.55	-0.01	190.18	186.14	4.04	0	3	0	189.14	
22	3:45	56.64	54.02	2.62	133.54	133.50	0.04	190.18	187.52	2.66	0	3	0	190.52	
23	4:00	56.64	54.00	2.64	127.86	133.35	-5.49	184.50	187.35	-2.85	0	3	0	190.35	
24	4:15	56.64	54.81	1.83	127.86	131.95	-4.09	184.50	186.75	-2.25	0	3	0	189.75	
25	4:30	56.64	54.89	1.75	127.86	130.40	-2.54	184.50	185.29	-0.79	0	3	0	188.29	
26	4:45	56.64	55.63	1.01	127.86	129.30	-1.44	184.50	184.93	-0.43	0	3	0	187.93	
27	5:00	56.64	53.35	3.29	118.39	129.00	-10.61	175.03	182.35	-7.32	0	3	0	185.35	
28	5:15	56.64	52.31	4.33	118.39	128.35	-9.96	175.03	180.66	-5.63	0	3	0	183.66	
29	5:30	56.64	51.42	5.22	118.39	127.20	-8.81	175.03	178.62	-3.59	0	3	0	181.62	
30	5:45	56.64	52.42	4.22	118.39	125.65	-7.26	175.03	178.07	-3.04	0	3	0	181.07	
31	6:00	56.64	55.71	0.93	113.65	125.50	-11.85	170.29	181.21	-10.92	0	3	0	184.21	
32	6:15	56.64	52.58	4.06	113.65	121.35	-7.70	170.29	173.93	-3.64	0	3	0	176.93	
33	6:30	56.64	52.39	4.25	113.65	119.90	-6.25	170.29	172.29	-2.00	0	3	0	175.29	

Sheet1 Sheet2 Sheet3

READY

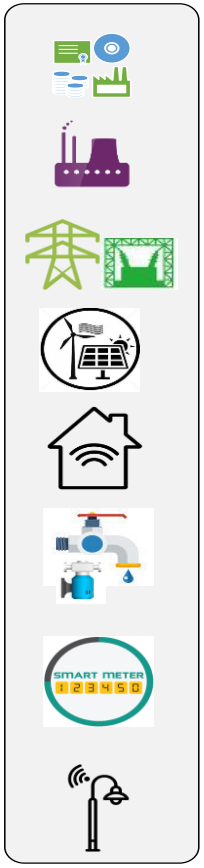
EMS Realtime Views





Product MAP

Sensors / Devices
Plant Fields



Communication Middleware
RBH ICx Gateway (USP)

ICX GATEWAY
SDK / API

Windows / Linux Platforms

ICxRTU

Raspberry Pi

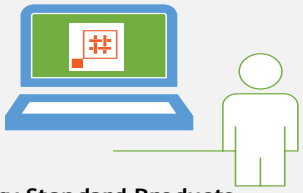
Arduino

4G

IoT Gateway

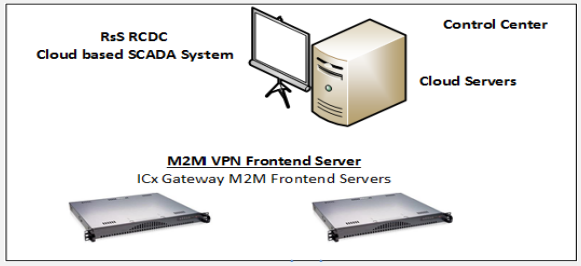
Any Type of Sensor / Vendor / Technology Supports 90% of industrial communication standards

Digital Dashboards/ Displays
RBH RsS SCADA



Industry Standard Products
Dashboard / Reports / Interactive Plant Operations / Monitoring / Control System Alerts / Simulations

- Automation Platform
- Energy Management System
- Building Management System
- Substation Automation System
- Demand Management System
- Load Shedding Analytics



RBH Products

SCADA Systems • Substation Automation • Centralized Monitoring System	**Metering Systems** • MDM / MDAS Solutions • EMS Systems • Metering Headend / Data Concentrators
Gateway Systems • Gateway / Data Concentrator • M2M / Remote Devices Connectivity over VPN • IEC / MODBUS / DLMS / OPC / ICCP / DNP3 / MQTT	**Networking Solutions** • Serial / Ethernet / Fiber Convertors • Ethernet / Fiber Switches • MODEMs

Solutions for Distribution Utility

- Substation Automation
  - Local SCADA and Centralized SCADA System
  - Support for IEC, MODBUS, DLMS, OPC Protocols
  - Gateway / RTU / FRTU Based
  - M2M / Secure VPN based Central Communication Platform
- RT-DAS – IPDS Projects
  - Control Center Infrastructure
  - Substation RTUs / FRTUs
  - SAIDI / SAIFI Calculations
- Meter Data Management Solution
  - VPN Enabled Secure / M2M enabled Headend System
  - Multi vendor / multi protocol (MODBUS / DLMS) support
  - DCU / Gateway based
- Automatic Demand Management System
  - Load Shedding
  - Outage Management System
  - FRTU / Gateway based

Solutions for Distribution Utility

- DT Transformer Monitoring Unit
  - Installation of DT Monitoring Unit
  - Centralized monitoring and remote tripping of DTs
  - Preventive Maintenance
- MDAS / Energy Management System
  - Metering data and billing solution
  - Utility Grade Billing and Management
  - Customer Portal and comprehensive accounts management solution
  - Data analysis and energy management
- FRTUs / DCU / Substation Gateways
  - Substation / RMU FRTUs
  - Metering Data Concentrators (DCUs)
  - Substation Alerts (SMS & Email) Solution
  - GPRS / 3G / 4G Modems and Routers

Key Customers

ALSTOM

SIEMENS

Schneider Electric

ABB

Honeywell

AREVA

Chemtrols

SEL

Atos

EMERSON

SATURN PYRO SDN. BHD.

Rockwell Automation