

Energy Monitoring & Management System

By Mitsubishi Electric

DID YOU KNOW?

► Situation of Primary Energy Demand in India

<https://powermin.nic.in/en/content/energy-efficiency>



- Bureau of Energy Efficiency (2002) and Energy Conservation Directorate to Monitor and Promote Energy Conservation
- Any Commercial Building must comply with Energy Conservation Building Code (ECBC)
- There are many buildings that are not ECBC compliant
- There are many buildings that consume more Energy Than Prescribed Norms
- An Installation must Ensure to Keep their Connected Demand Less than Contract Demand

**What Should we do as User
(Buildings, Industries)??**

Contents

E.M.S. Concept and Need

One Solution Many Advantages

Product Awareness

Reports and Dashboards

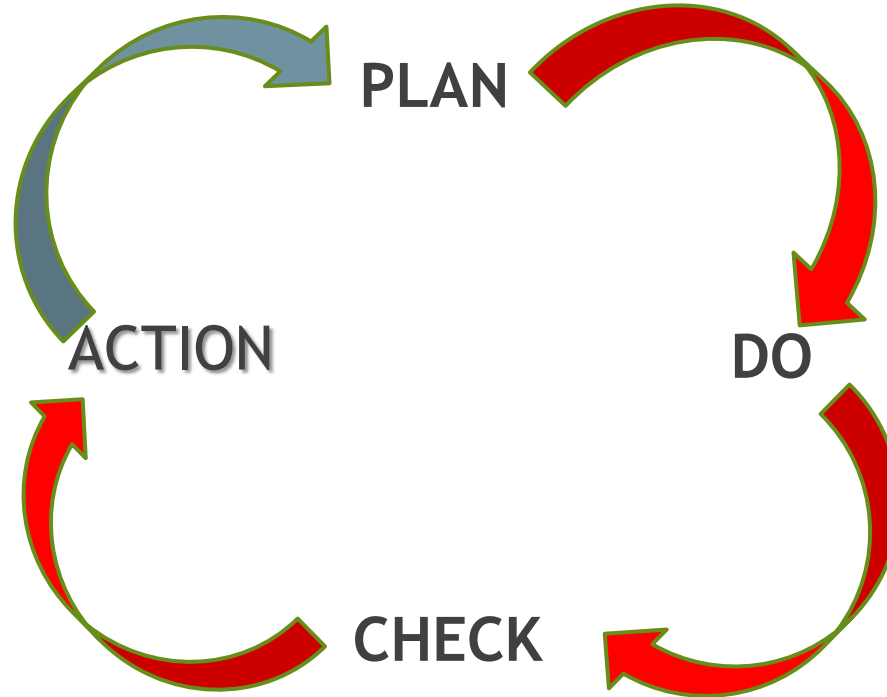
Activity Flow Chart

EMS Solution Model



Energy Monitoring System - Concept And Need

CONCEPT



NEED

Abide by the Laws and Regulations Laid by Government

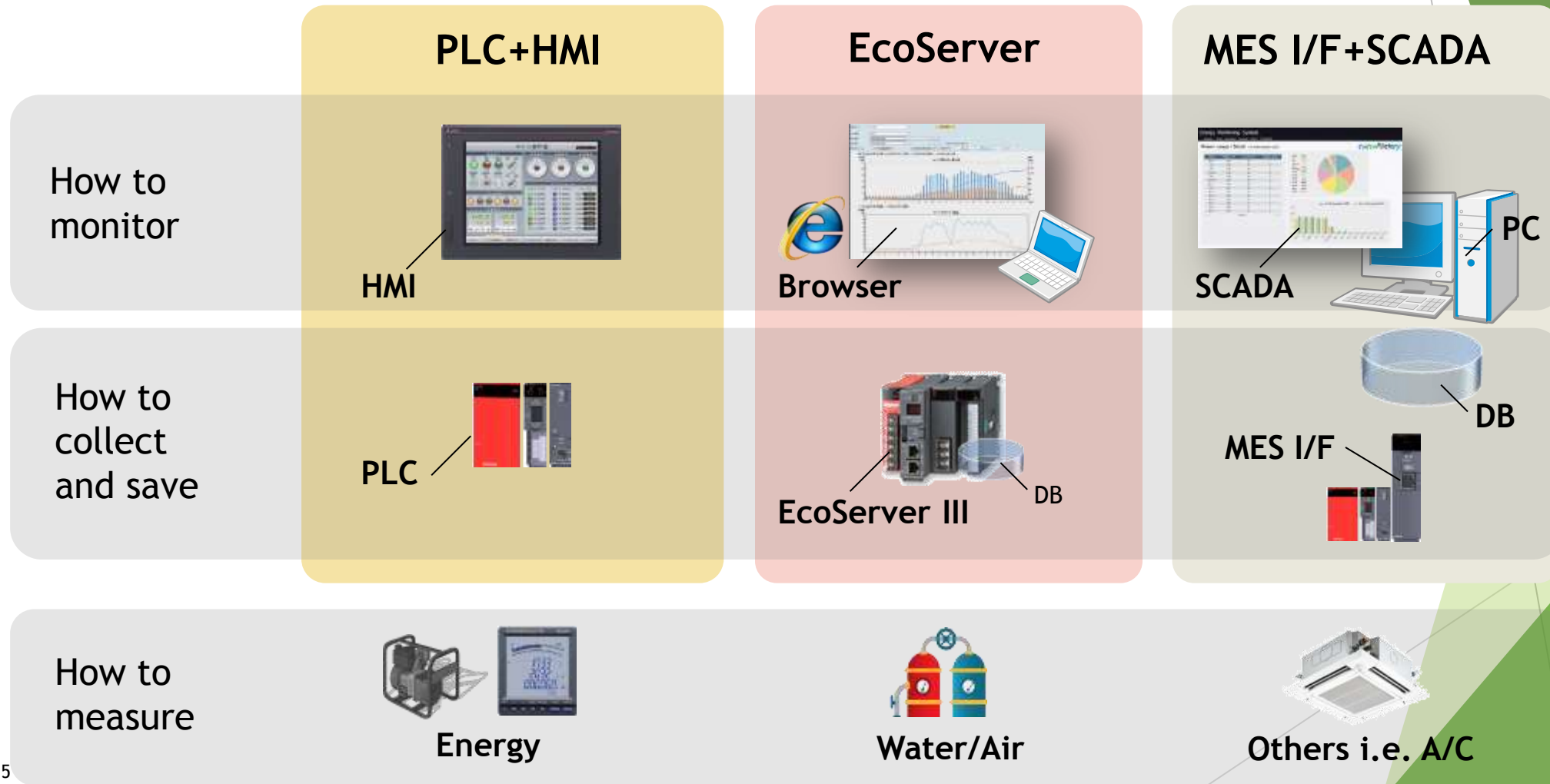
Reduce Energy Cost & Improve Production Efficiency

Effective Preventive Maintenance (Health Check)

Desirable Reports to Analyze and Act

Energy Monitoring System - Concept And Need

We can provide 3 types of Energy Monitoring Systems.



One System Many Solutions

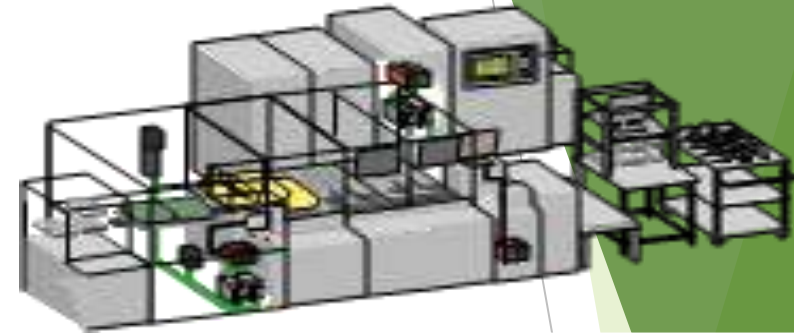


Monitor Contract Demand

Current value monitor (Group) Accumulated value 10/4/2017, Wed, 13:45:41

ID	Name	Current value
1	Cubicle01 Cubicle 01 Current	11.8 A
2	Cubicle01 Cubicle 01 Voltage	101.8 V
3	Cubicle01 Cubicle 01 Power	211.8 kW
4	Cubicle01 Cubicle 01 Energy	131004 kWh
5	Cubicle01 Cubicle 01 Power factor	99.3 %
6	Cubicle01 Air Con. Energy	3111 kWh
7	Cubicle01 Illumination Energy	119 kWh
8	Cubicle01 Outlet Energy	1251 kWh

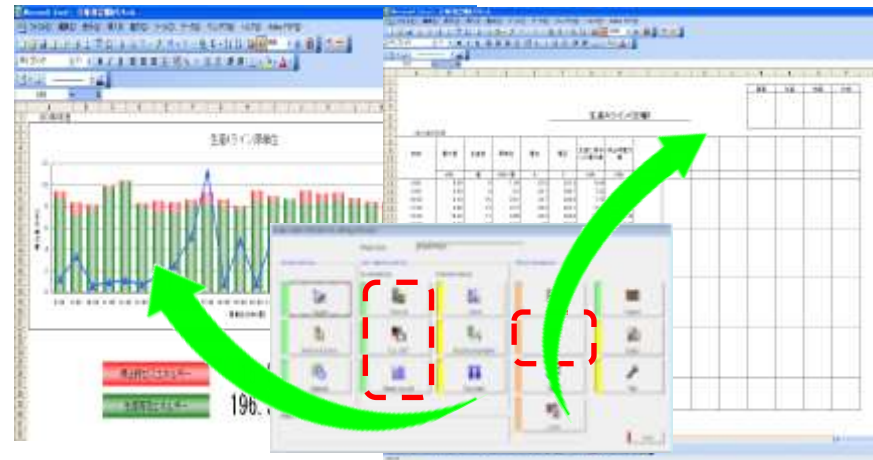
Measure I, V, KW, KWH, Hz, Pf, Harmonics



Measure Per Piece Product Efficiency



Oil, Gas, Water, CO2 Level

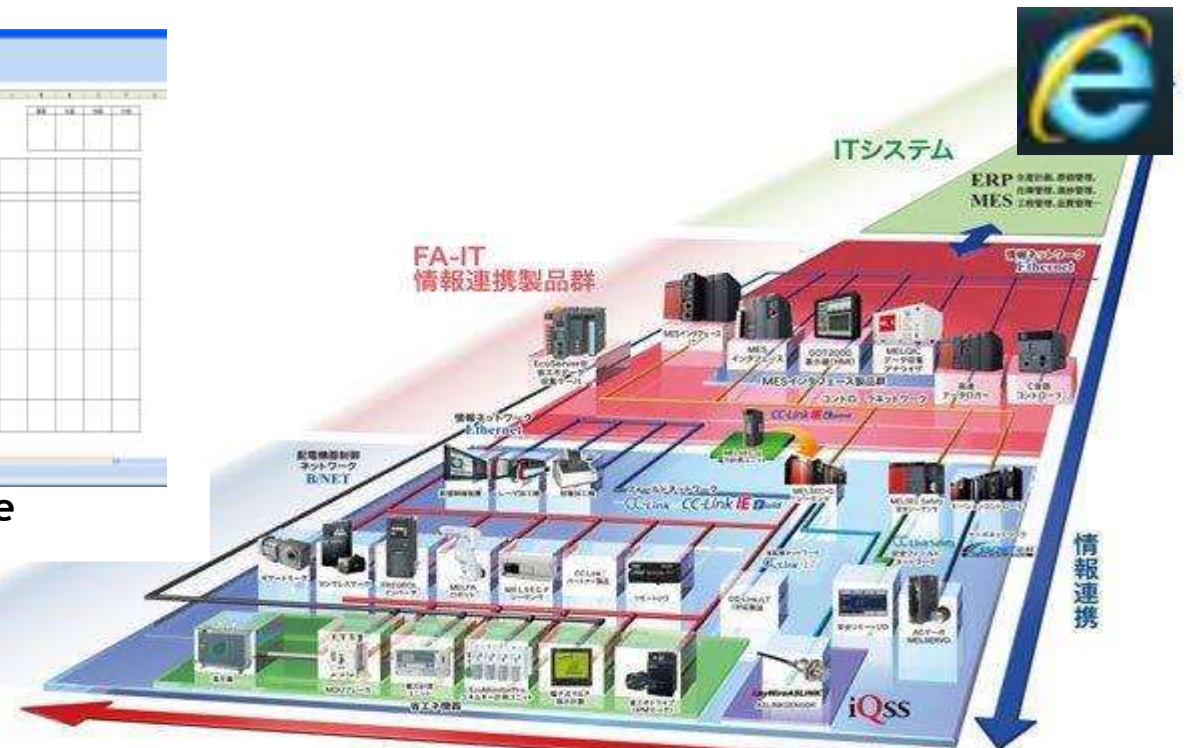


Reports Through Software



Equipment Health:

Temperature, Vibration, Current, Insulation



View Anywhere Machine, Line, Floor, Factory LAN or Web

Products Awareness - Hardware

Measuring Devices for Single Circuit



ME96SS



Eco Monitor Light



EMMS7

1-Phase/3-Phase: I, V, KW, KVA, KVAR, KWH, KVARH, DM, Hz, Pf, Harmonics, mA

LV/MV/HV Circuit Measurements. No VT for LV up to 440 V

LCD / LED Display, Easy Navigation and Setting Buttons

MB-RTU (RS-485) Standard Inbuilt. MB-TCP/ CC-link Options Available

Data Logging Module and SD Card Options Available

Optional Modules available for Analogue Input, Pulse I/Os

Free
Setting
Software



SD CARD



CC-Link Comm

Products Awareness - Hardware

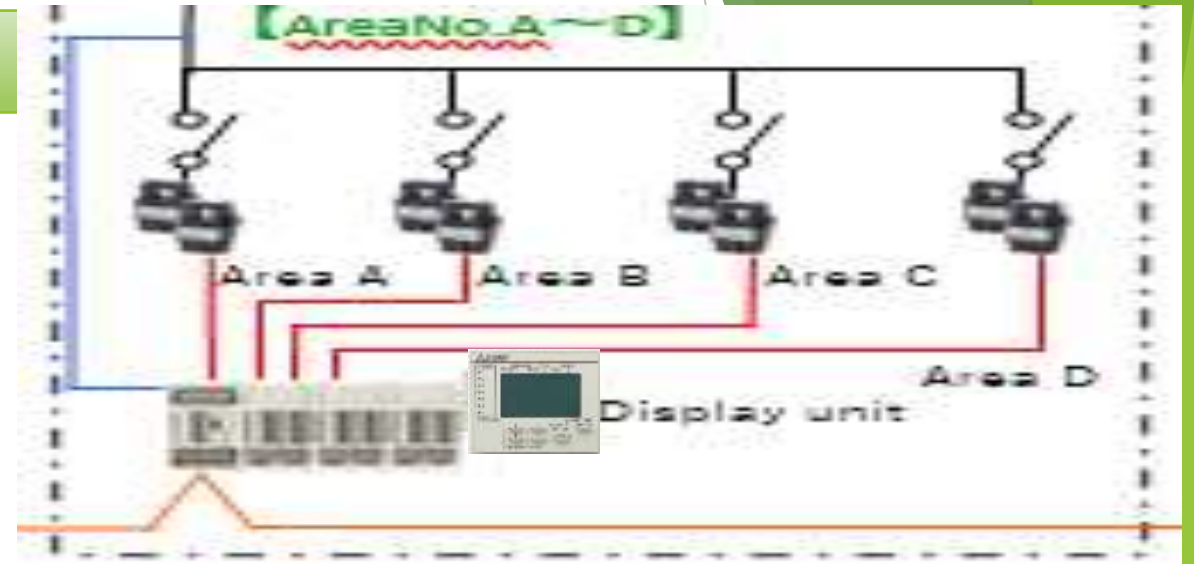
Measuring Device for Multiple Circuit



Eco Monitor Plus



Display Unit



Expandable Up to 7 Circuits, Same / Different Voltages

1-Ph/3-Ph: I, V, KW, KVA, KVAR, KWH, KVARH, DM, Hz, Pf, Harmonics, mA

LV/MV/HV Circuit Measurements. No VT up to 440 V

Plug & Play Type LCD Display for Monitoring and Setting

MB-RTU (RS-485) Standard Inbuilt. CC-link Options Available

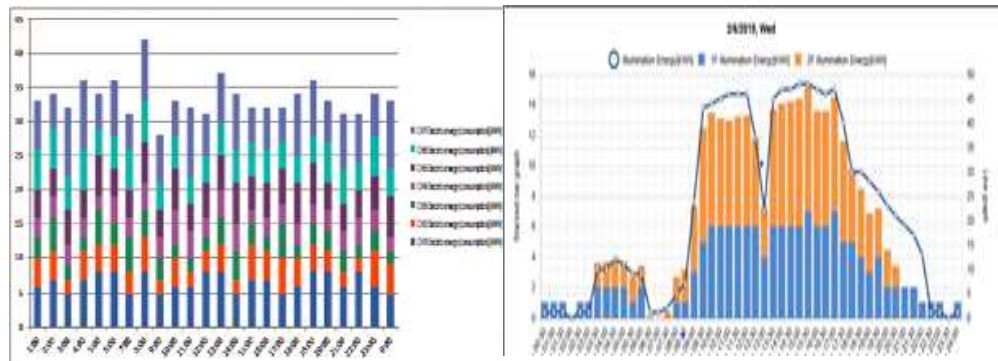
Data Logging Module and SD Card Options Available

Optional Modules for Analogue, Pulse I/Os (Specific Consumptions)

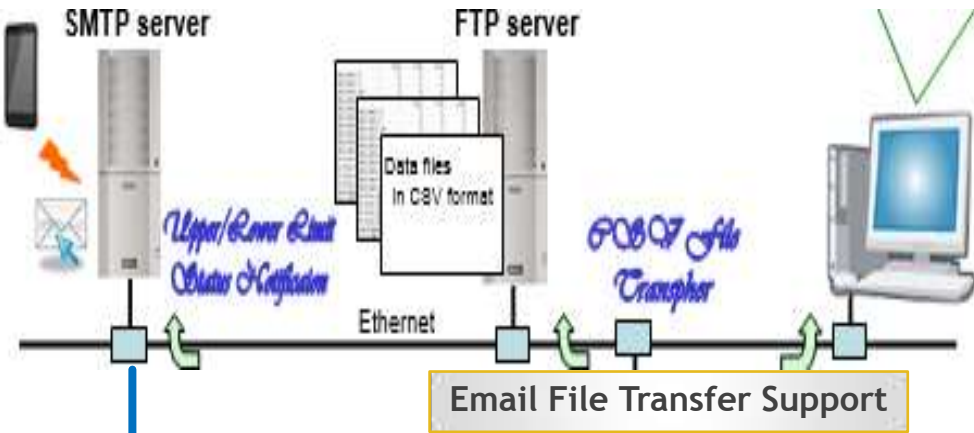
Free
Setting
Software

Products Awareness - Hardware

Eco Web Server III (Your Web Access Gateway to Data)



Reports. Graph and Other Data on Web No SCADA Needed



Email File Transfer Support

CSV Format Output

Inbuilt CF Card for Data Logging

InBuilt Ethernet (2 Channels) & CC Link Communication

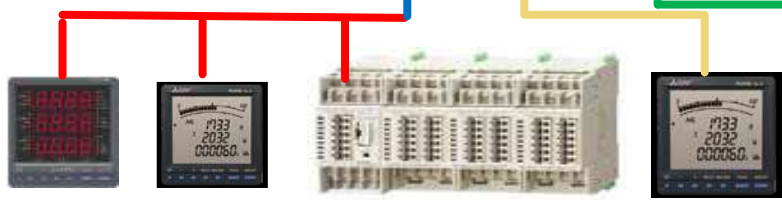
Free Setting Software



Pulse Input (Demand Monitoring)

Aux Power (Demand Time Count)

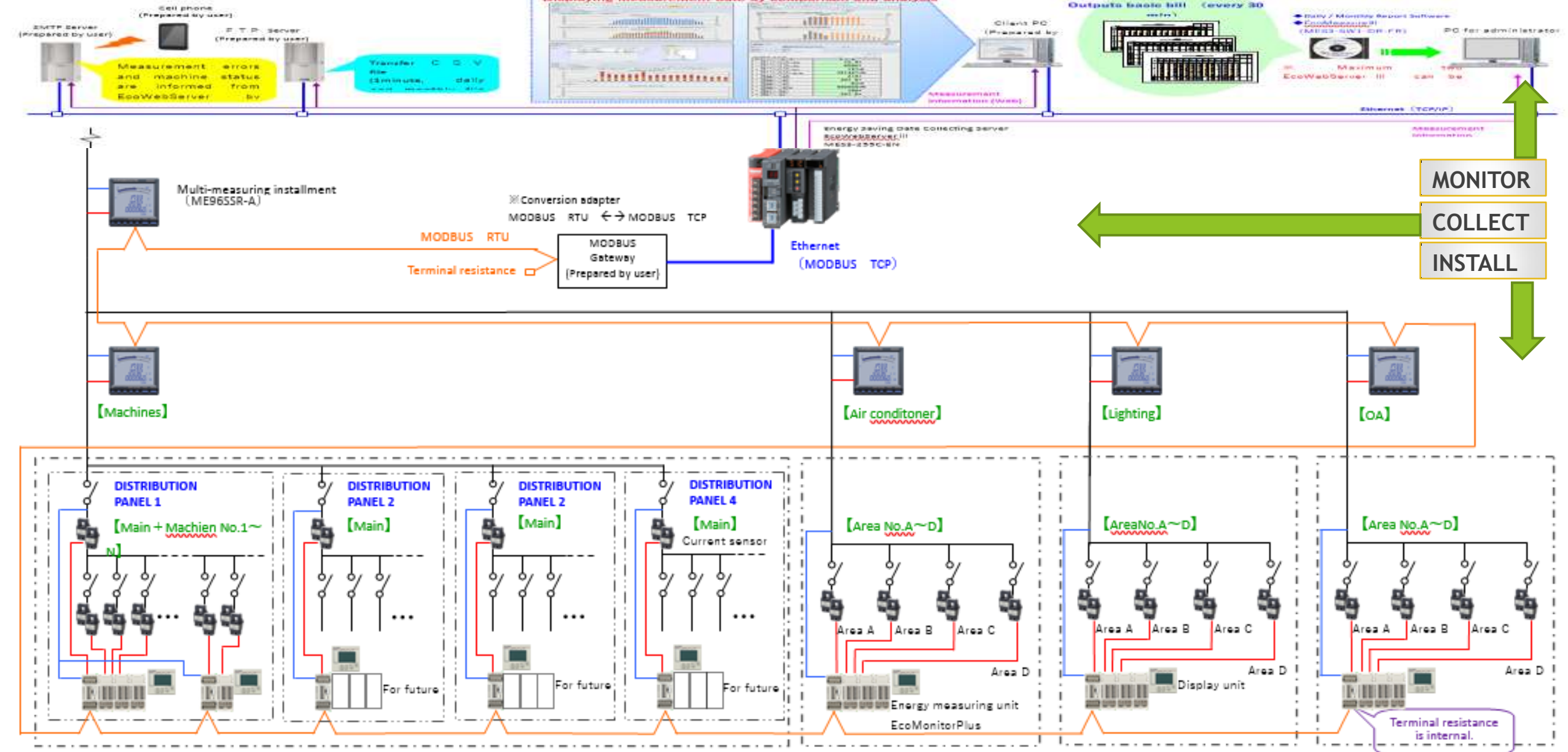
16 Digital Outputs for Alarms and Control (Energy Management)



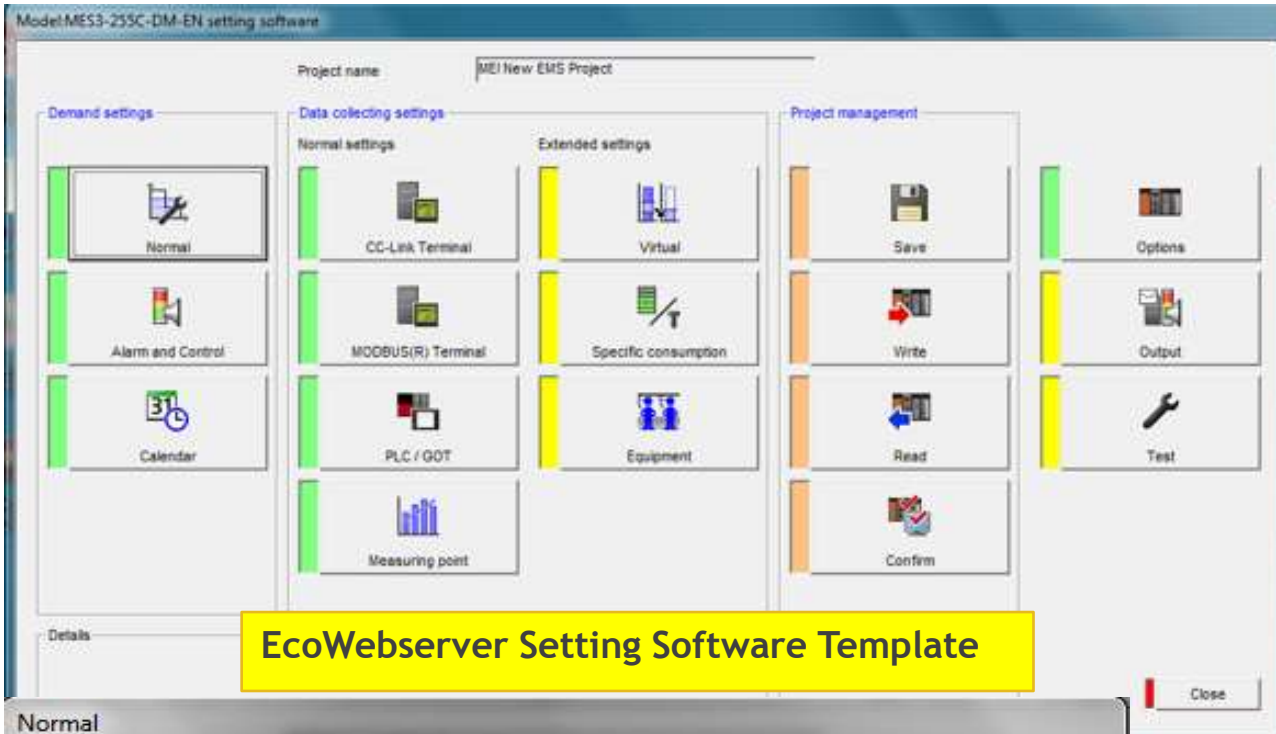
Collects Data from Measuring Devices

Products Awareness - Hardware (Scheme)

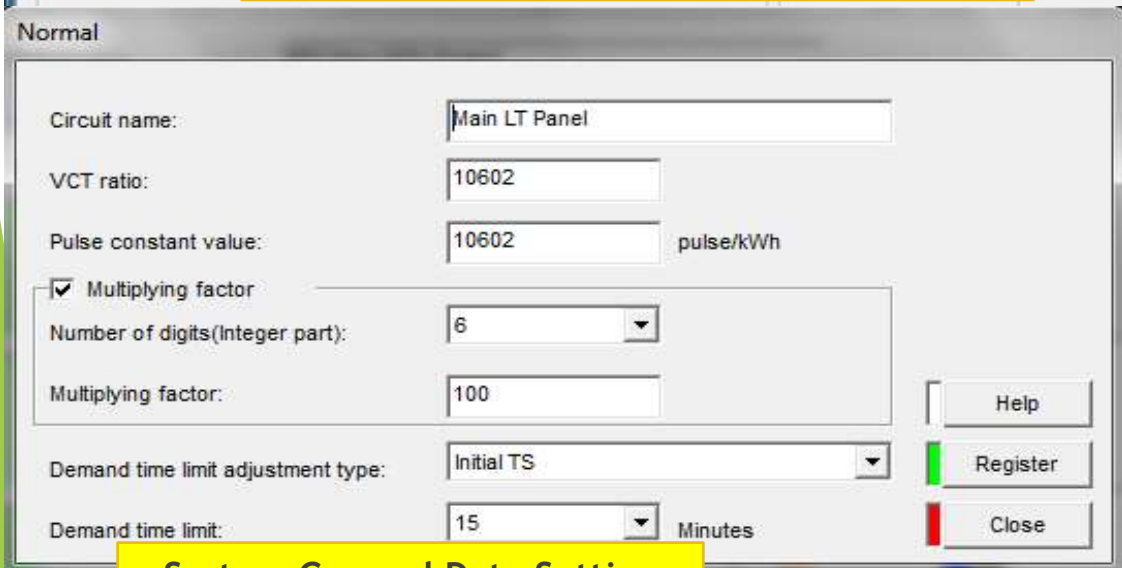
4. System Architecture (MODBUS RTU communication)



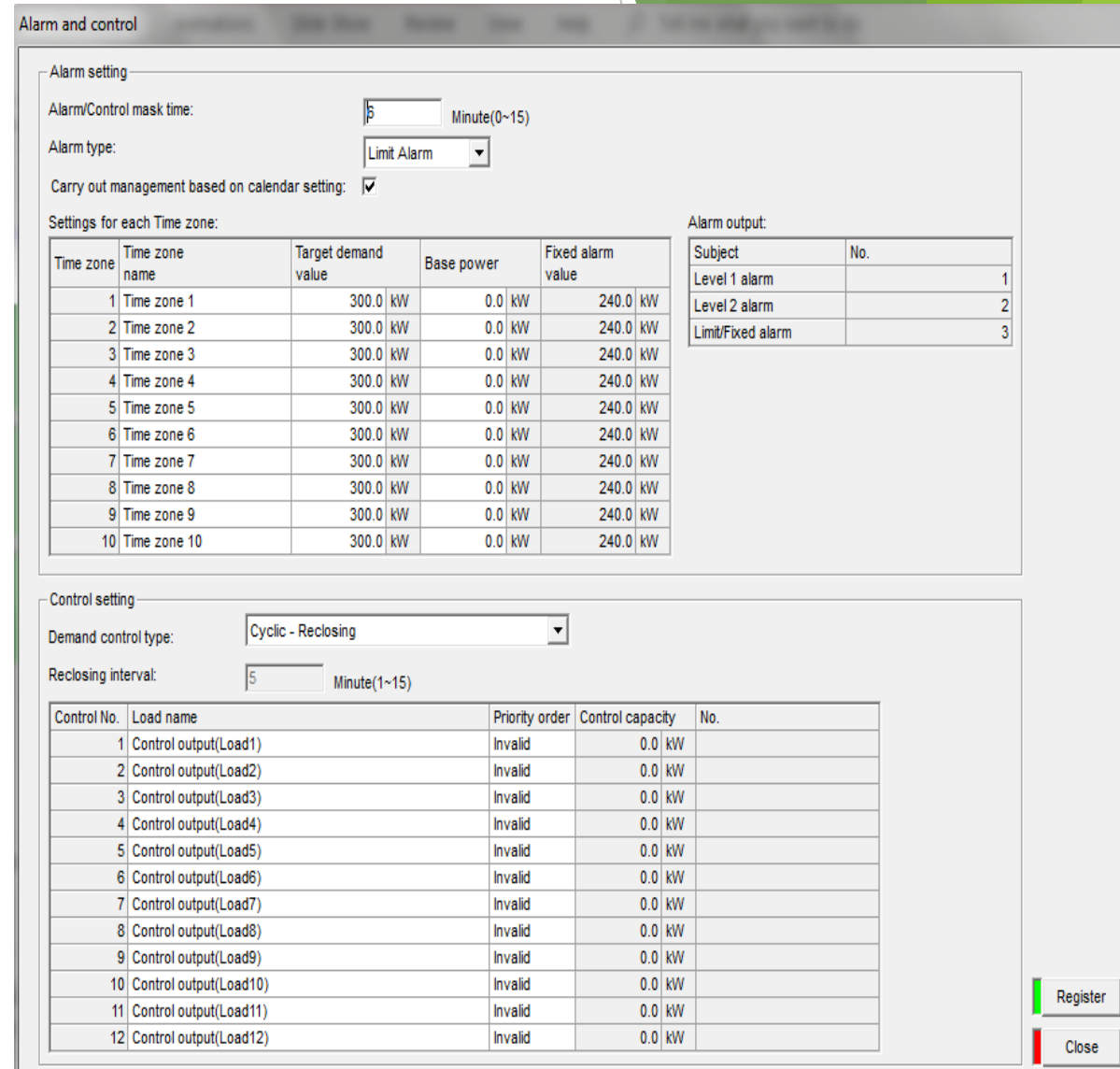
Products Awareness - Software



EcoWebserver Setting Software Template



System General Data Setting



Alarm and Control Setting

Products Awareness - Software

MODBUS(R) Terminal


No.	Terminal name	Model name	IP address	Port No.	Slave address
1	Capacitor Panel OG	EMU4-FD1-MB	110.110.110.10	502	1
2	Industrial Fan in utilit	EMU4-FD1-MB	110.110.110.11	502	-
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

No.:

Name:

Point type: MODBUS(R) Terminal[Supported] Generic MODBUS(R) Terminal

MODBUS(R) Terminal[Supported]

Model:  EMU4-FD1-MB
Energy measuring unit(5A/1A CT)

Protocol:

IP address: . . . Port No.:

Slave address:

Model information

PhaseWire:

RatedVoltage: V (1 - 6600V)

RatedCurrent: A (1.0 - 6000A)

Device Registration

ID	Measuring point name	Terminal name	Measuring item	Unit	Group	Monitoring	Lower limit value	Upper limit value
1	Main MV Incomer KWH	Main MV Incomer	Active_energy_import	kWh	Group1	not set	0	0
2	Pump Avg Current	Pump	Current_Average	A	Group1	not set	0	0
3	Measuring point3	Industrial Fan in utilit	Electric_energy(Cons)	kWh	Group1	not set	0	0
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

ID:

Name:

Point type: CC-Link Terminal MODBUS(R) Terminal Generic MODBUS(R) Terminal
 PLO(CC-Link) PLO(Ethernet)

CC-Link Terminal

Name:

Model:

Station No.:

Detail

Item: Unit:

Number of Upper and Lower limit monitoring:0(up to 32)

Number of Operation monitoring:0(up to 32)

Number of Energy planned value monitoring:0

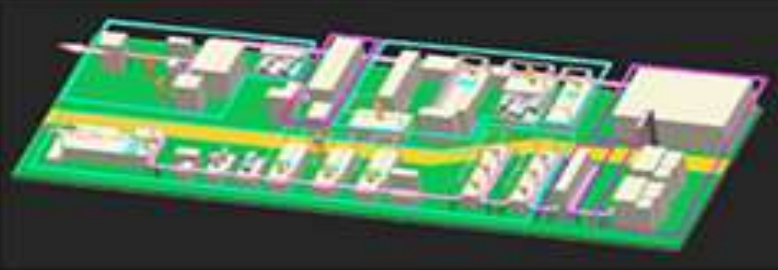
Measurable Data point Registration

Reports & Dashboards

Display Sample

Production line Sp.Cons control

Assembly Line



Assembly Line_kWh
Day (3/15/2019)

97.95[kWh]

CHK last_OK
Day (3/15/2019)

1649[Piece]

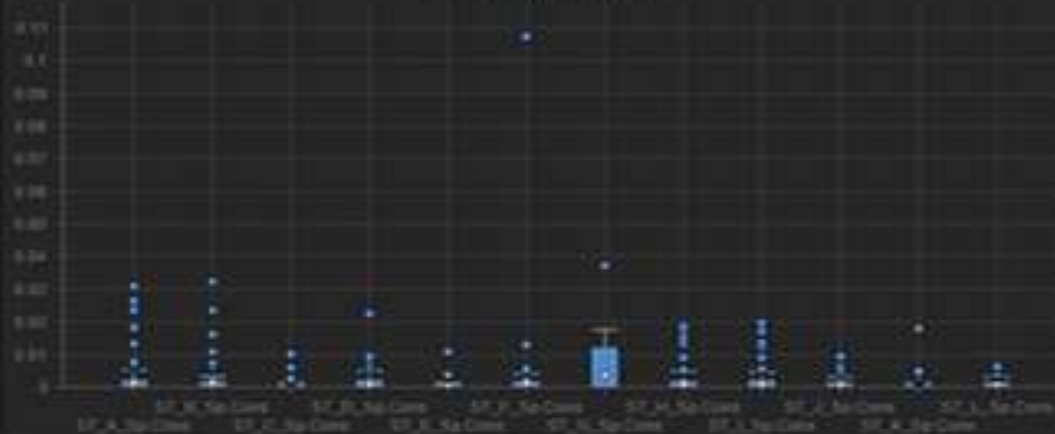
CHK last_NO
Day (3/15/2019)

35[Piece]

For each facility

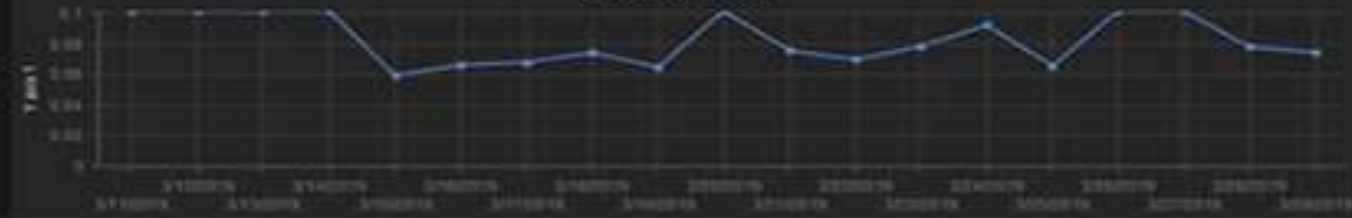
Variation in Sp. Cons by ST

Hour 3/15/2019 - 3/16/2019



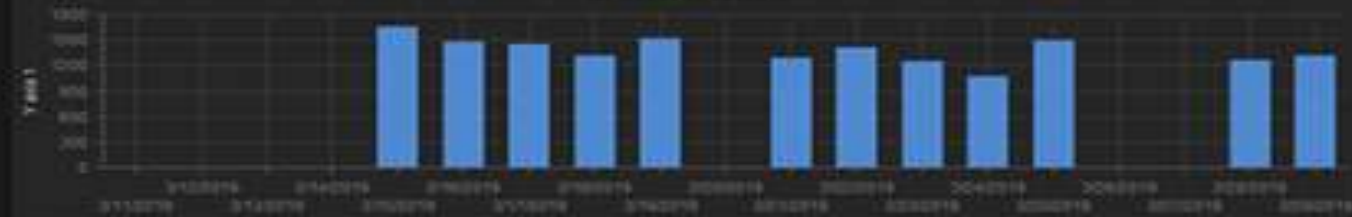
Assembly line Sp Cons day

Day 3/15/2019 - 3/16/2019



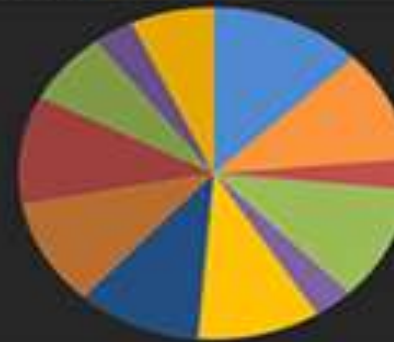
Assembly line production day

Day 3/15/2019 - 3/16/2019



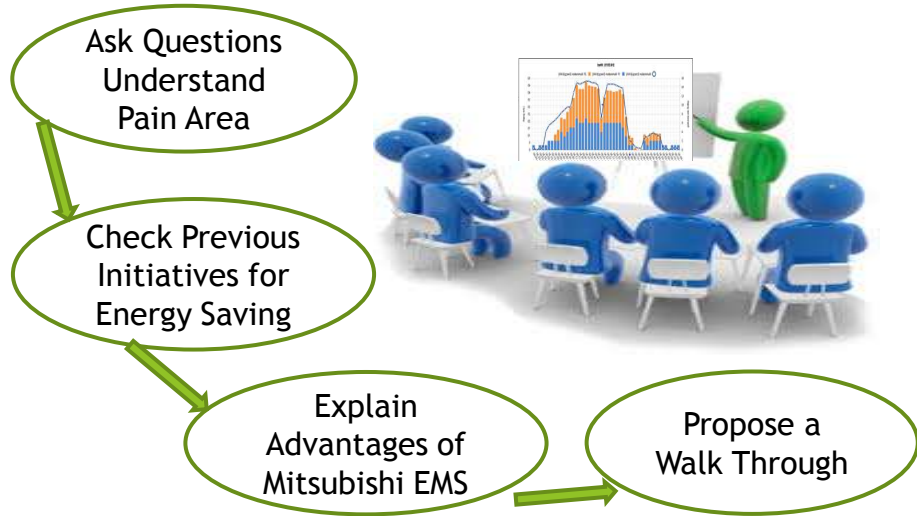
Proportion of kWh by ST

Hour 3/15/2019 12:00 AM - 3/16/2019 12:00 AM

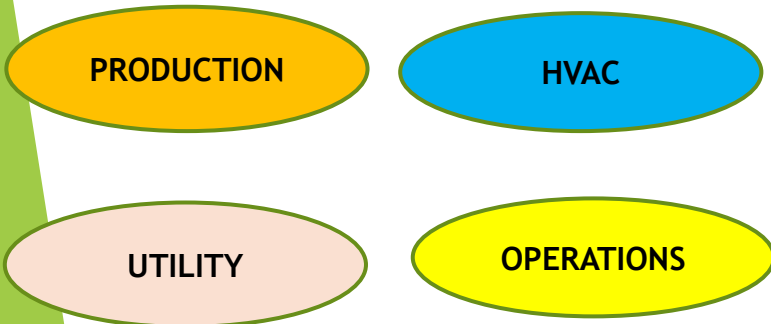


EMS Activity Flow Chart

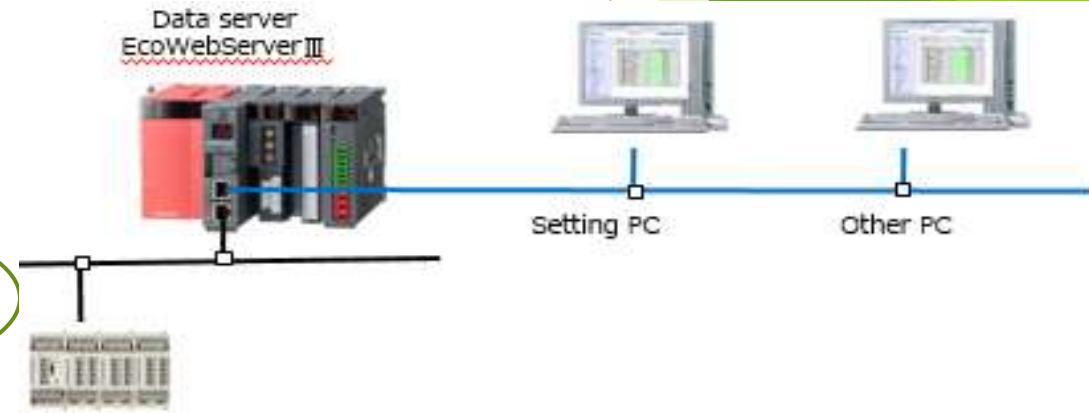
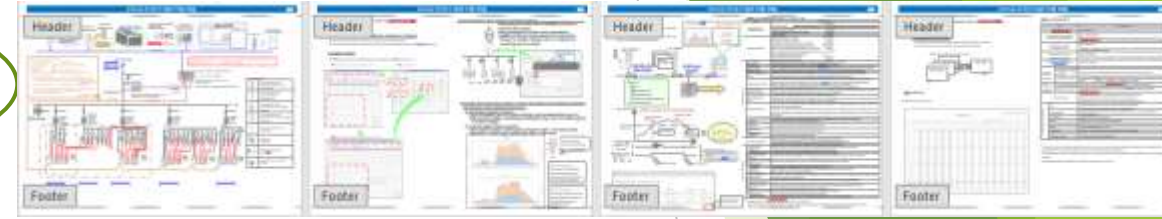
1. Meet End User/ Consultants Introduce Mitsubishi's EMS



2. Evaluate Scope



3. Transaction Process



Efficie' Motors

APFC

Mac & Process Automation

OPERATIONS

THANK YOU