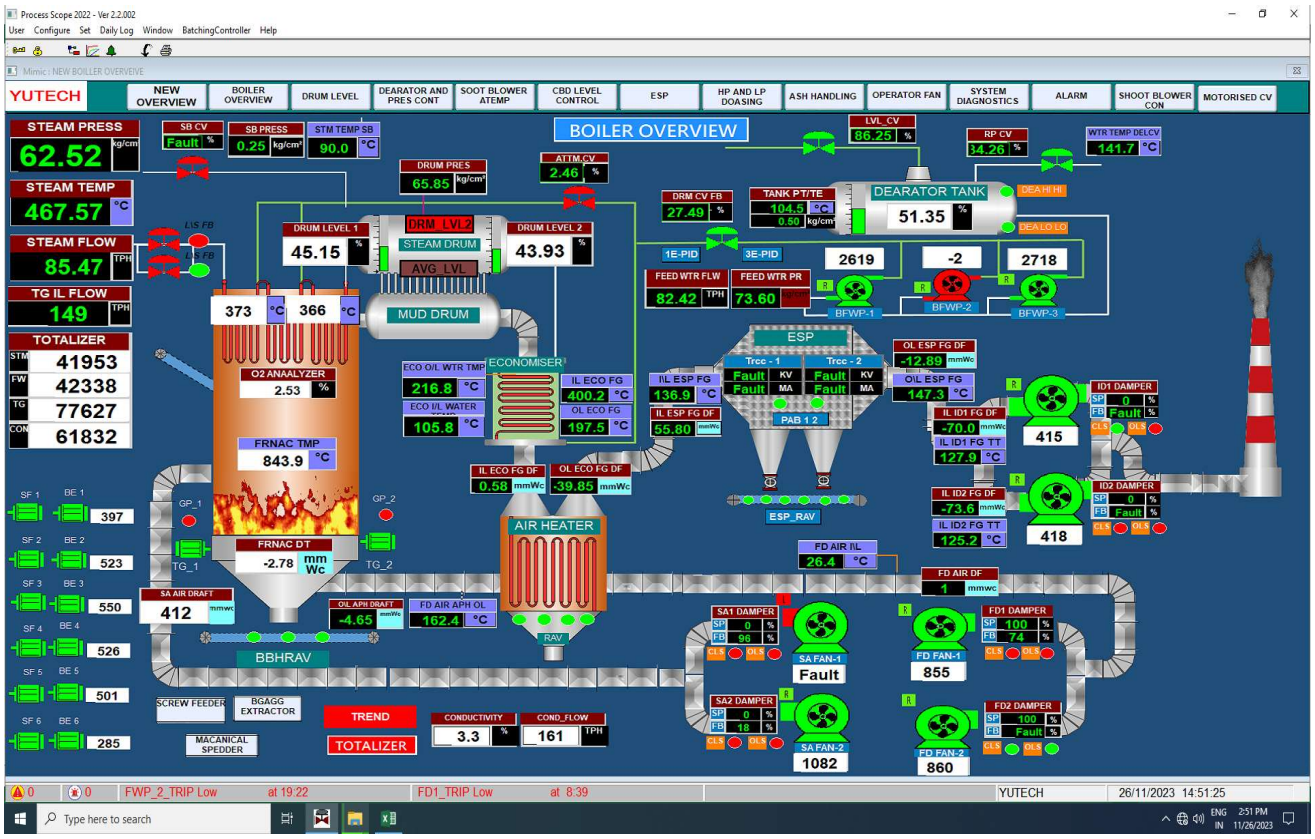
BOILER AND COMPLETE POWER PLANT AUTOMATION

DCS / PLC BASED TURNKEY POWER PLANT AUTOMATION SYSTEM

BOILER AUTOMATION ADVANTAGES AND SCHEMATIC DIAGRAM:



BOILER AUTOMATION ADVANTAGES:

- Improved Efficiency by 3-5%.
- Improved Steam to Fuel Ratio due to constant FW Temperature and increase in Boiler Efficiency (Please see Fuel Ratio Equation).
- Optimum Combustion Reduces Un-burnt Fuel Losses This is evident from:
  - Decrease in Oxygen and Increase in Carbon Dioxide Percentage in Flue Gas and at the same time reduction in Excess Air Percentage.
  - Reduction in Flue Gas Carbon Monoxide Percentage.
- Reduction in Excess Air means optimum usage of Fan Drives and thus Power Saving.
- Maintained Steam Drum Level with Pressure Compensation Ensures Optimum Steam Generation while compensating for Shrink and Swell in the Drum Level.
- Reduction in Clinker Formation due to good combustion condition.
- Reduction in Thermal Shocks, Improves Equipment Life Expectancy.
- Energy Savings in Electricity, Fuel, Water, Steam.
- Equipment Protection.
- All Key Performance Indicators are Highlighted and Recorded, hence Performance Records and Trends maintained which are used for:
  - Fault Finding and Identifying the Reasons.
  - Predictive Maintenance.
- Reduced Downtime.
- Ensure Maximum Up Time.

BOILER AND COMPLETE POWER PLANT AUTOMATION

DCS / PLC BASED TURNKEY POWER PLANT AUTOMATION SYSTEM

ADVANTAGES: Power Plant Automations Ensure Higher Efficiency:

Proper Combustion reaction in the Furnace Improves Boiler Efficiency, this in turn improves Steam to Fuel Ratio and leads to Fuel Saving. This can be demonstrated by Equation below:

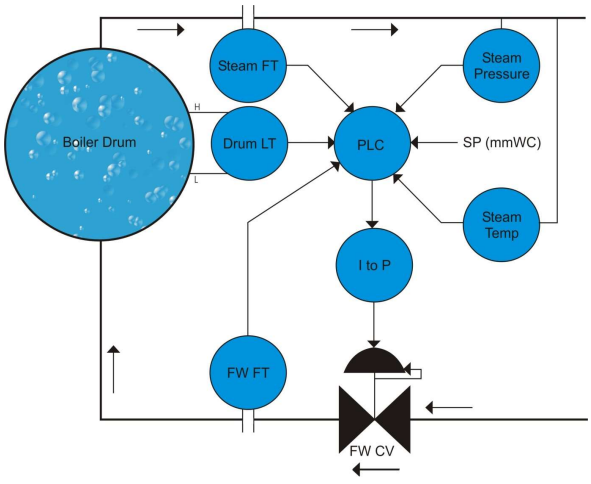
$$\text{Steam to Fuel Ratio} = \frac{\text{Fuel GCV x Boiler Efficiency}}{H - h}$$

Where:

H = Enthalpy of Superheated Steam
h = Enthalpy of Feed Water
Fuel GCV: Fuel's Gross Calorific Value

Our focus on maintaining higher temperature at De-Aerator further improves this equation.

STEAM AND WATER CONTROLS:



Advanced Three Element Control

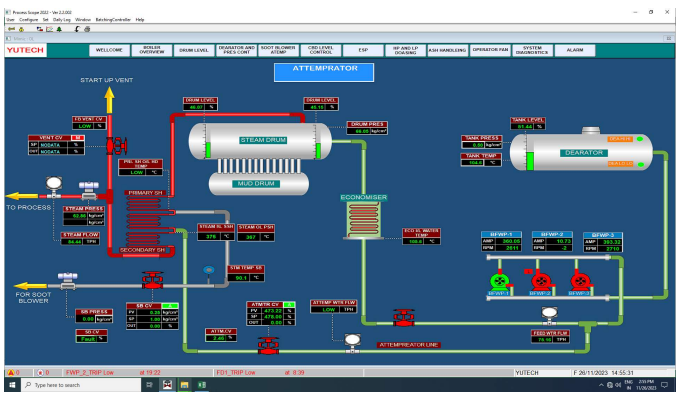
ADVANCEDTHREE ELEMENT CONTROL:

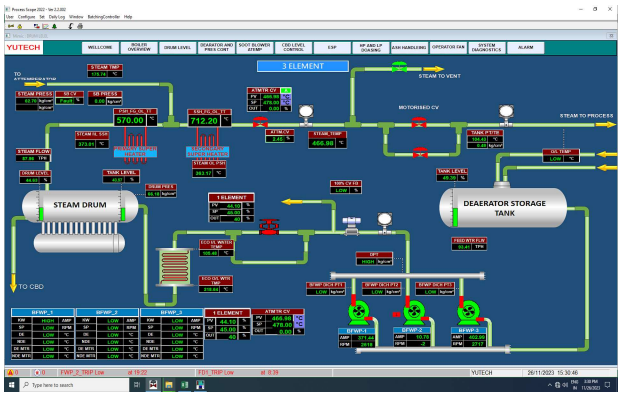
DRUM LEVEL, STEAM FLOW AND FEED WATER FLOW SENSING

FEED WATER FLOW CONTROL TO MAINTAIN DRUM LEVEL, CONSTANT STEAM FLOW, STEAM PRESSURE AND STEAM TEMPERATURE

STEAM PRESSURE AND STEAM TEMPERATURE COMPENSATION

COMPENSATION EQUATION FOR SHRINK AND SWELL IN THE DRUM LEVEL.

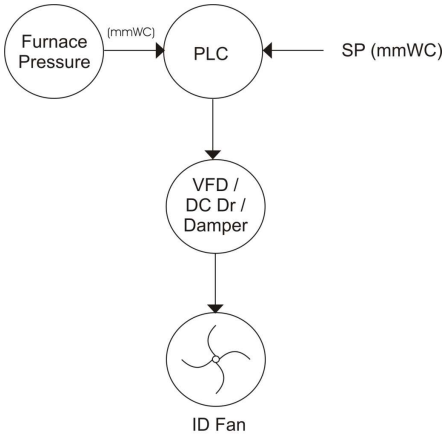




BOILER AND COMPLETE POWER PLANT AUTOMATION

DCS / PLC BASED TURNKEY POWER PLANT AUTOMATION SYSTEM

BOILER CONTROL LOOPS: COMBUSTION CONTROL



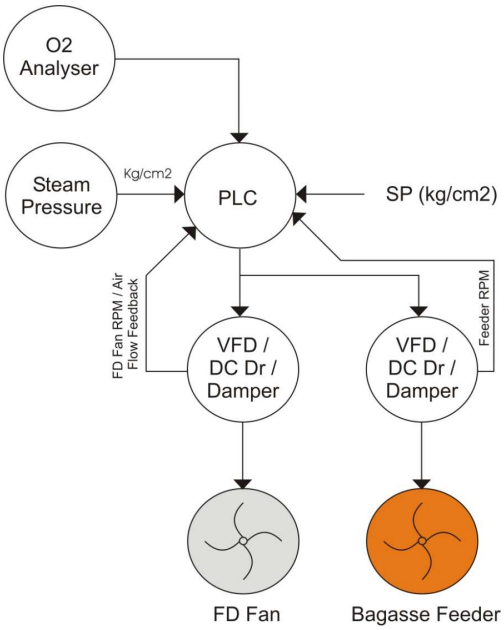
ID Fan Control Loop

INDUCED DRAUGHT FAN LOOP CONTROL:

FURNACE DRAUGHT PRESSURE SENSING

INDUCED DRAUGHT CONTROL

- **ID FAN VFD SPEED CONTROL**
- **ID FAN DAMPER CONTROL IF VFD UNAVAILABLE**



Advanced Combustion Control Loop

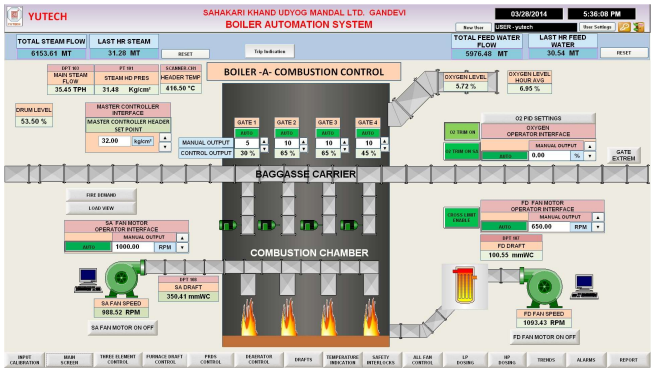
FORCED DRAUGHT FAN LOOP CONTROL:

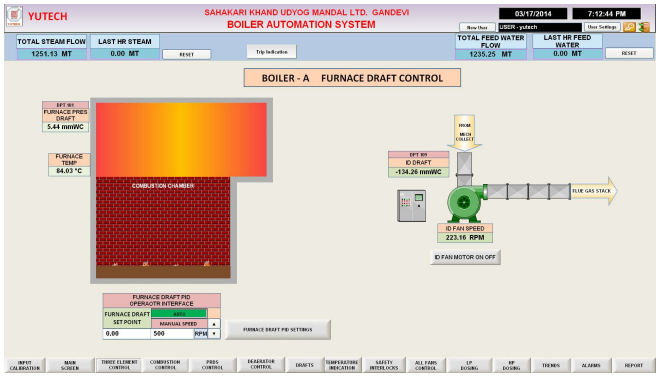
STEAM PRESSURE SENSING

FLUE GAS OXYGEN CONTENT SENSING

FORCED DRAUGHT CONTROL

- **FD FAN VFD SPEED CONTROL**
- **SECONDARY AIR FAN VFD CONTROL**
- **FD AND SA FAN DAMPER CONTROL IF VFD UNAVAILABLE**
- **BAGASSE FEEDER CARRIER VFD CONTROL**
- **BAGASSE GATE CONTROL**



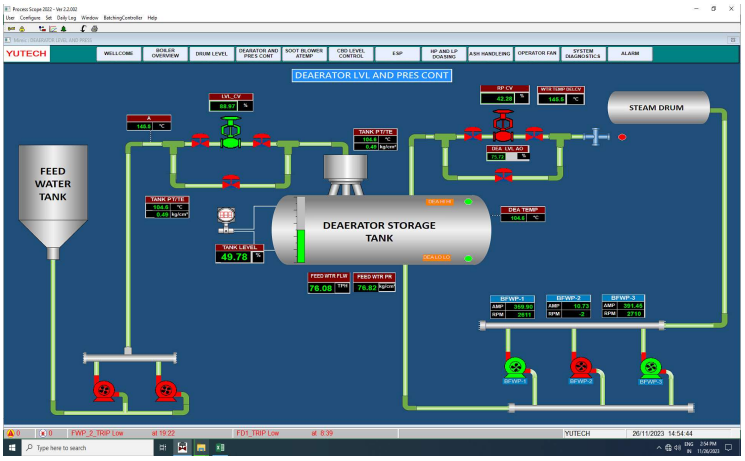


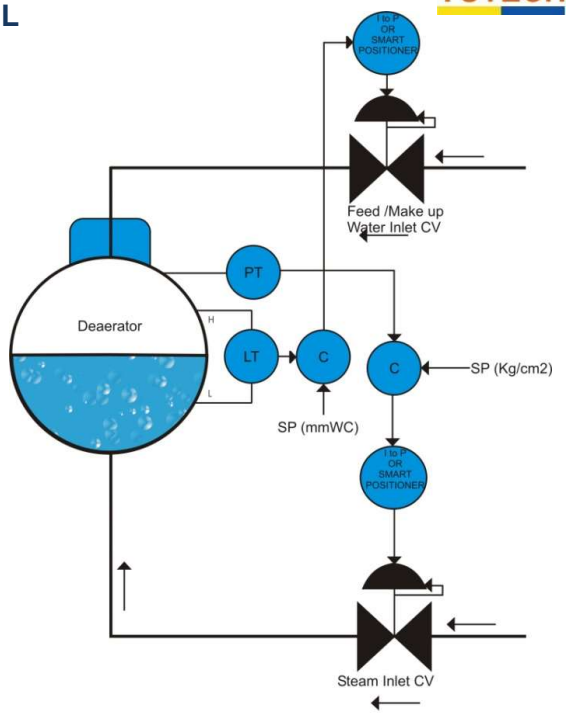
BOILER AND COMPLETE POWER PLANT AUTOMATION

DCS / PLC BASED TURNKEY POWER PLANT AUTOMATION SYSTEM

YUTECH

BOILER CONTROL LOOPS: DE-AERATOR CONTROL





Boiler Deaerator Control

DE-AERATOR CONTROL:

DE-AERATOR PRESSURE AND LEVEL SENSING

DE-AERATOR TEMPERATURE SENSING

MAKE UP WATER CONTROL AND DEAERATOR PRESSURE CONTROL

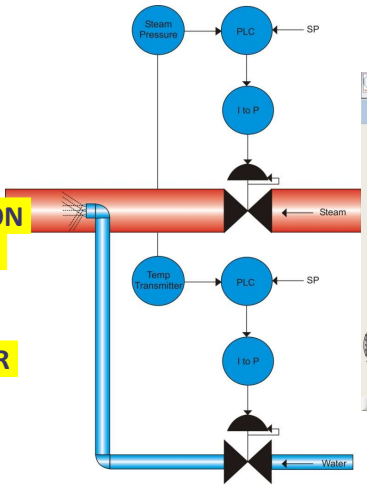
PRESSURE REDUCING AND DE-SUPERHEATING STATION:

STEAM PRESSURE AND TEMPERATURE SENSING

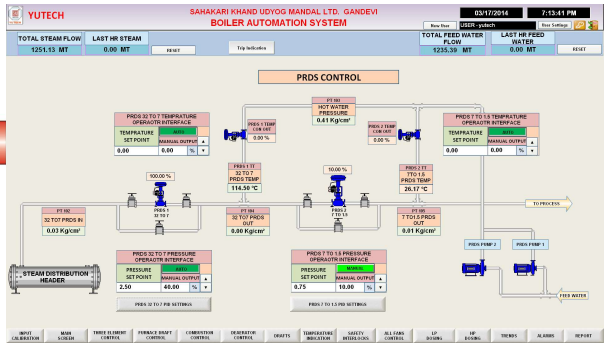
DE-AERATOR SENSING

STEAM PRESSURE REDUCTION BY CONTROLLING PRESSURE REDUCING VALVE

HOT WATER OR FEED WATER INTAKE CONTROL



PRDS Control



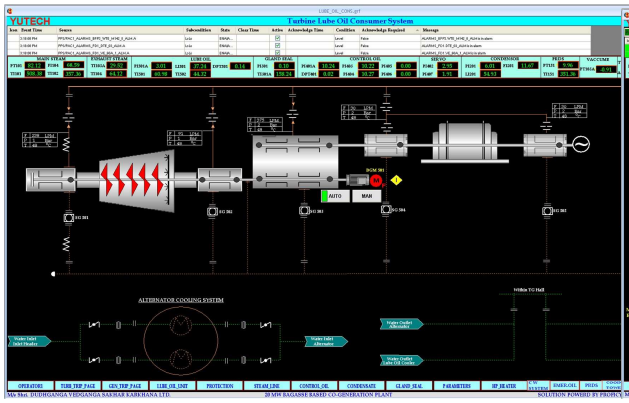
FIELD INSTRUMENTS INSTALLATION PICTURES

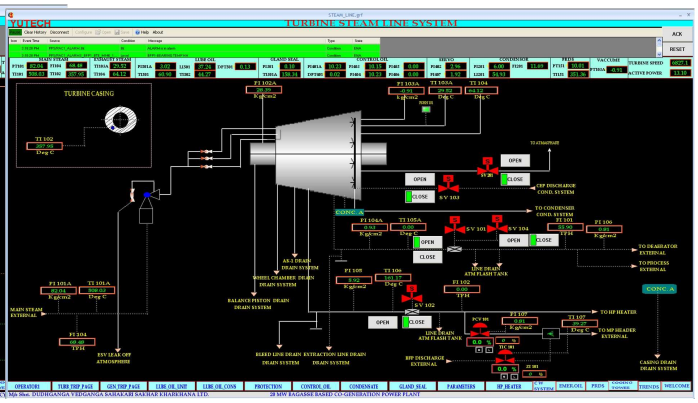
BOILER AND COMPLETE POWER PLANT AUTOMATION

DCS / PLC BASED TURNKEY POWER PLANT AUTOMATION SYSTEM

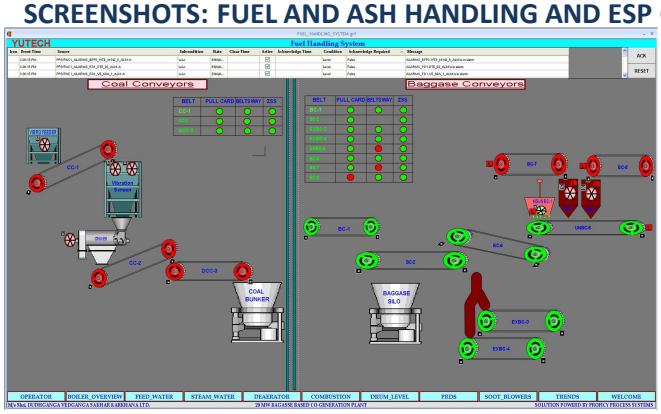
YUTECH SINCE 1978

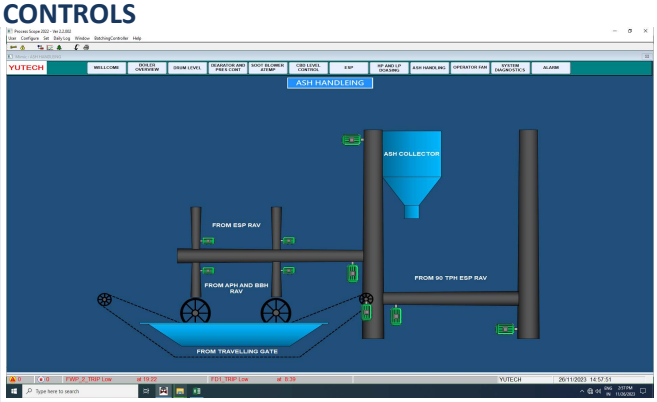
TURBINE MONITORING: SCREENSHOTS

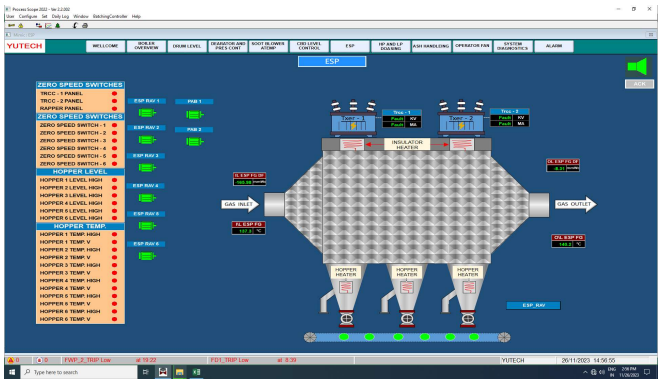


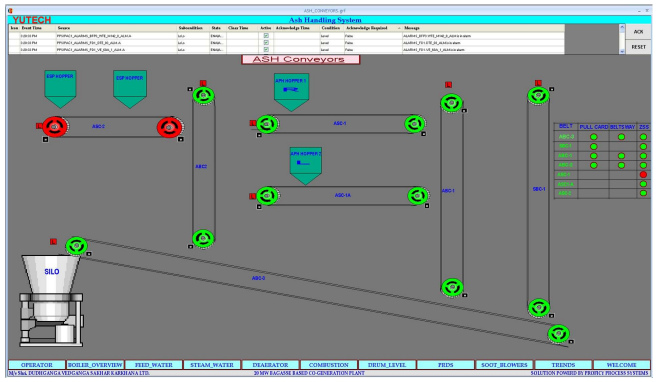


SCREENSHOTS: FUEL AND ASH HANDLING AND ESP CONTROLS

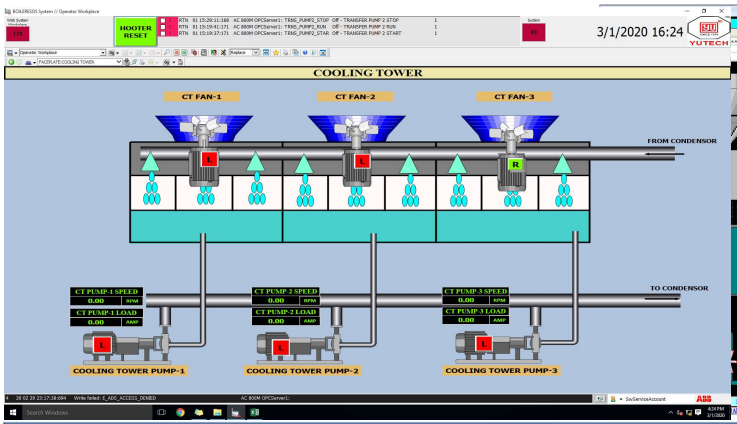


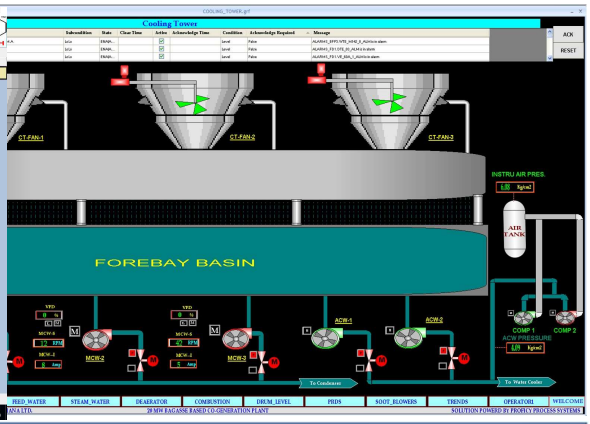




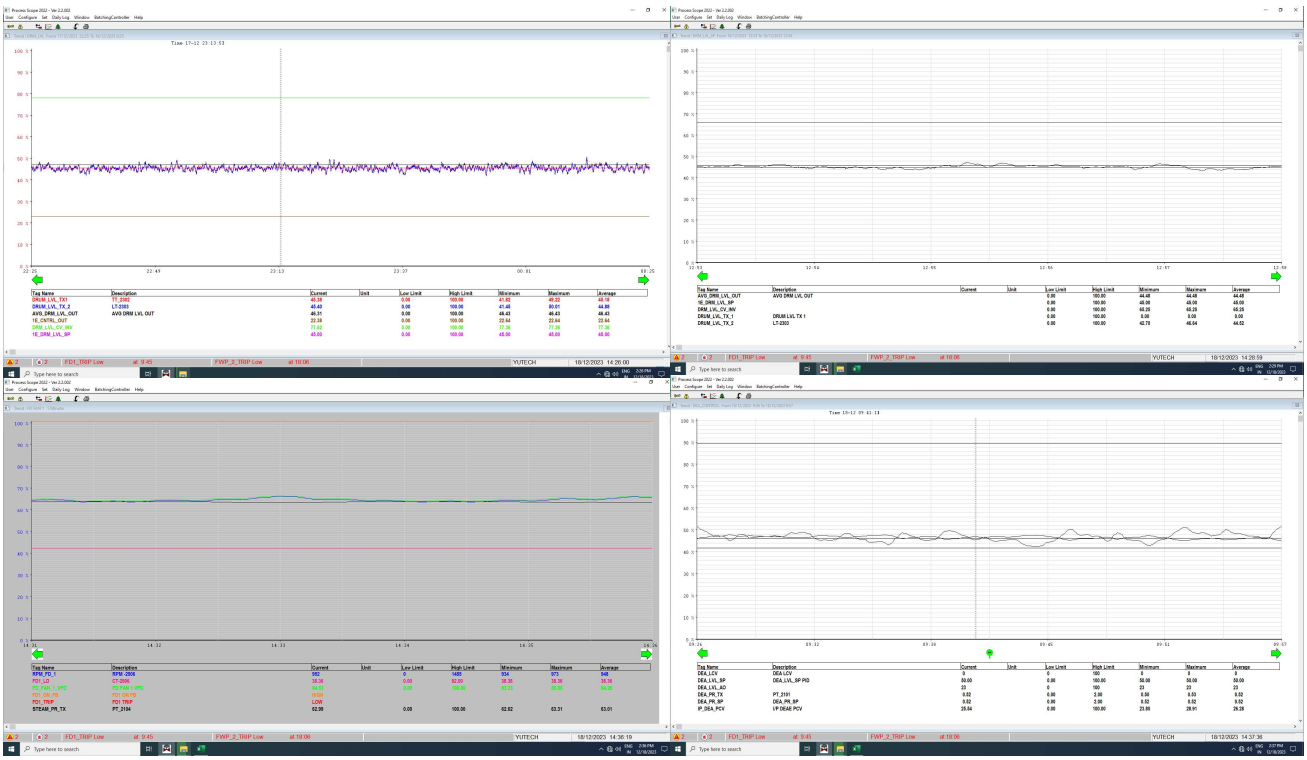


COOLING TOWER CONTROLS: SCREENSHOTS

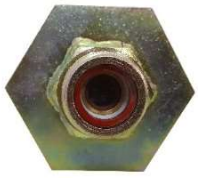




TRENDS: SCREENSHOT



YUTECH INFRA RED LEVEL SENSING AND TRANSMISSION SYSTEM FOR BOILER BAGASSE SILO:



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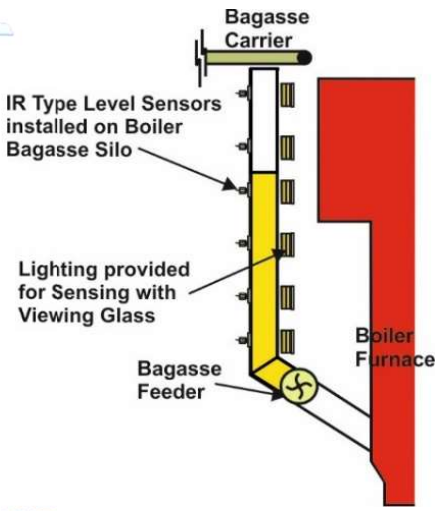
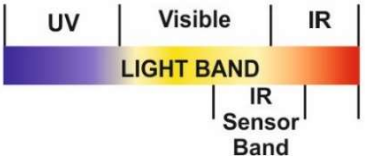


YUTECH INFRA RED LEVEL SENSOR INSTALLATION ON BOILER BAGASSE SILO: SCHEMATIC DIAGRAM

IR Sensor's Light Sensing Band for IR Type Donnelly Chute Level Sensors



PLEASE DOWNLOAD THE YUTECH IR LEVEL SENSING AND TRANSMISSION SYSTEM FOR BAGASSE SILO BROCHURE FROM OUR WEBSITE FOR MORE DETAILS.

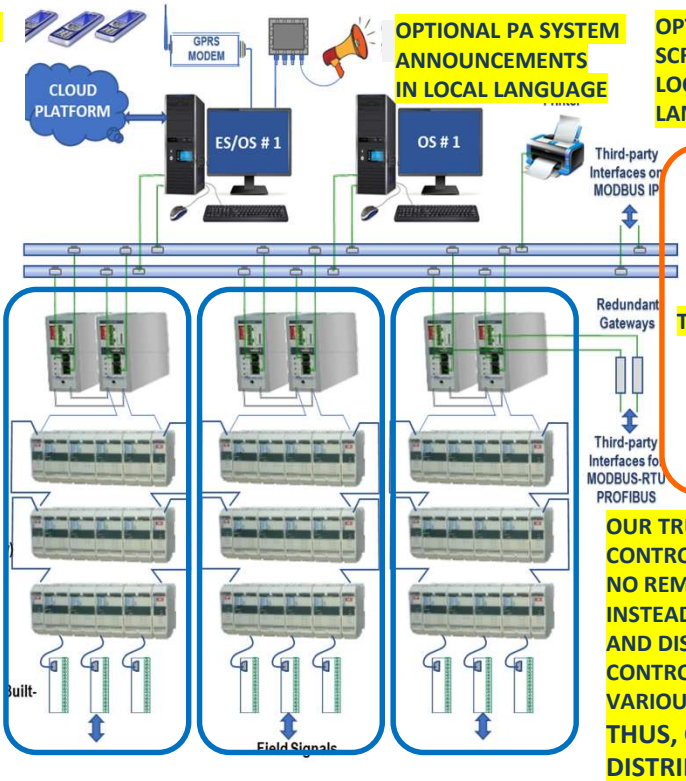
MICROVERSE DCS

YUTECH IS MICROVERSE DCS'S GLOBAL DISTRIBUTOR AND CHANNEL PARTNER FOR SUGAR AND ALLIED INDUSTRIES

UNMATCHED AND UNLIMITED SCALABILITY FROM 100 TO 30000 I/Os IN ONE ETHERNET SUBNET MASK

GPRS MODEM FOR SMS / ALERTS

ERP CONNECTIVITY



OPTIONAL PA SYSTEM ANNOUNCEMENTS IN LOCAL LANGUAGE

OPTIONAL SCREENS IN LOCAL LANGUAGE

NO LIMITS ON TAGS OR SCREENS

NO LIMITS ON THIRD PARTY DATA TAGS

NO DREADED EXPENSIVE UPGRADES

DCS: MICROSYS 3200 ET, CAN BE CONFIGURED AS A COMPLETE REDUNDANT SYSTEM WITH TRIPPLE REDUDANCY

REDUDANCIES OFFERED:

- CONTROLLER
  - LOCAL PANEL LEVEL
  - COMPLETE SYSTEM LEVEL
- COMMUNICATIONS
  - INTERNAL IO BUS
  - ETHERNET
  - PROFIBUS
  - MODBUS RTU
- POWER SUPPLY
- INPUT AND OUPUT
- COMPLETE SYSTEM AS A STANDBY REDUNDANT SYSTEM

OUR TRUE DISTRIBUTED CONTROL SYSTEM HAS NO REMOTE I/O PANELS INSTEAD IT HAS REMOTE AND DISTRIBUTED CONTROLLER PANELS AT VARIOUS STATIONS

THUS, CONTROL IS DISTRIBUTED AND NOT CENTRALLIZED

MICROSYS 3200 ET SYSTEM KEY FEATURES

UNMATCHED MEMORY - 512MB EXPANDABLE TO 4GB

- BEST CLOCK TIME - 720MHz AND BEST SCAN TIME: 100mSEC
- BUMPLESS, BALANCE-LESS, AND GLITCH-FREE REDUNDANCY
- UNLIMITED TAGS
- INEXPENSIVE UPGRADES
- BUILT-IN CLOUD CONNECTIVITY
- BUILT-IN INDUSTRIAL INTERNET OF THINGS (IIOT) CONNECTIVITY
  - BUILT-IN APIs FOR INTEGRATION WITH CLOUD PLATFORMS, MOBILE APPS TO MAKE DATA ACCESSIBLE ON CUSTOM-BUILT MOBILE PLATFORMS AND WEB-DASHBOARDS.
- BUILT-IN ERP CONNECTIVITY
- A HIGHLY FLEXIBLE AND SCALABLE SYSTEM ALLOWS CONFIGURATIONS LOWER THAN 100 I/OS TO OVER 16,000 I/OS WHICH CAN BE EXTENDED EVEN TO 24000 I/Os PER SUBNET MASK. MEANING A NEW NETWORK EXPANDS YOUR I/Os BY 16000 - 24000. THUS, THERE IS NO TOP LIMIT ON I/Os.
- SERVER-LESS BASIC CONFIGURATION WITH MULTI-MASTER, MULTI-SLAVE TOPOLOGY
- MEAN TIME BETWEEN FAILURES (MTBF): 12,07,420 HRS.
- MEAN TIME TO REPAIR (MTTR): LESS THAN 30 MINUTES (>1/2 HR), TO REPLACE HOT-SWAPPABLE MODULE.
- SYSTEM AVAILABILITY: 0.999999, THAT'S BETTER THAN 99.9999%

PLEASE DOWNLOAD MICROVERSE DCS BROCHURE FROM OUR WEBSITE FOR MORE DETAILS.

MICROVERSE DCS

- AUTOMATIC, BUMP-LESS, BALANCE-LESS, AND GLITCH-FREE REDUNDANCIES AT ALL LEVELS AS BELOW:
  - CONTROLLERS
  - I/O MODULES
  - COMMUNICATION BUSES BETWEEN CONTROLLERS AND I/O MODULES
  - COMMUNICATION BUSES BETWEEN CONTROLLERS, AND ENGINEERING / OPERATOR STATIONS
  - POWER SUPPLIES.
- DIAGNOSTIC INFORMATION ABOUT EVERY SYSTEM ELEMENT IS AVAILABLE ON ENGINEERING AND OPERATOR STATIONS
- HOT-SWAPPABLE SYSTEM ELEMENTS ARE HOT-REMOVABLE / HOT-INSERTABLE
- FACILITY FOR SD CARD
- IO SUB-SYSTEM REDUNDANT COMMUNICATION PORTS: 2
- TWO 100MBPS REDUNDANT ETHERNET PORTS FOR ENGINEERING AND OPERATOR STATIONS
- TWO RS 232 SERIAL PORTS
- USB 2.0 PORT: 1 FOR INTERFACING THIRD-PARTY COMMUNICATION DEVICES
- I/Os PER CONTROLLER: 512 OR 32 MODULES. THIS FEATURE MAINTAINS BEST-IN-CLASS SCAN TIME
- BUILT-IN DRIVERS FOR MODBUS-IP AND MODBUS-RTU AND FOR AUDIO PORT (1 NO.)
- POWERFUL DIAGNOSTICS
- 24 VDC POWER SUPPLY

MICROSYS 3200 ET SYSTEM: SOFTWARE TOOLS

- SYSDEV - FUNCTIONAL BLOCK DIAGRAMS (FBD) APPLICATION LOGIC DEVELOPMENT TOOL
- PSCOPE 22 - GRAPHICS USER INTERFACE
- BATCH MANAGEMENT TOOLS

MICROSYS 3200 ET SYSTEM: MODULES

General Specifications:

- Channel-to-channel Isolation For Analog Modules
- Group Isolation Digital Modules
- All Modules Come With Status Indication LEDs For Individual Channels
- All I/O Modules And Bus Interface Modules Are Din-rail Mounted And Stacked Together
- Controllers Are Din-rail Mounted
- All I/Os And Interface Modules Are Hot-swappable
- Redundant Communication Interface Between I/O Modules And Controllers
- 24 Vdc Power To I/O Modules
- Prefab Cables

Bus Connector: T-bus Back-plane To Install Hot-swappable Modules
Analog Input Modules: ET-AI-2-8, ET-AI-2-16, ET-AI-2-24, 16-bit Resolution Analog Input Module
Digital Input Modules: ET-DI-2-8, ET-DI-2-16, 8-channel And 16-channel Digital Input Module
Analog Output Modules: ET-A0-2-8, ET-A0-2-16, 8 And 16-channel 16-bit Resolution Analog Output Module
Digital Output Modules: ET-DO-2-16, ET-DO-2-32, 16 & 32-channel Digital Output Module
Pulse Input Modules: ET-PI-2-8, 8-channel Pulse Input Module, Fr-range Up To 10 Khz
Ser Input Modules: ET-SE-2-15 15-channel Ser Module (SER Is Sequential Event Register Also Called SOE / SOER Meaning Sequence Of Events Register), Event Resolution: 1 Milli-Second
Bus Interface Modules: ET-BIM-1, ET-BIM-2

PLEASE VISIT OUR WEBSITE www.yutechautomation.com.

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