# EffiMax™

Boiler Manager for Solid Fuel Fired Boilers

# FORBES MARSHALL

# EffiMax™

## Buying an Efficient Boiler does not Guarantee High Efficiency
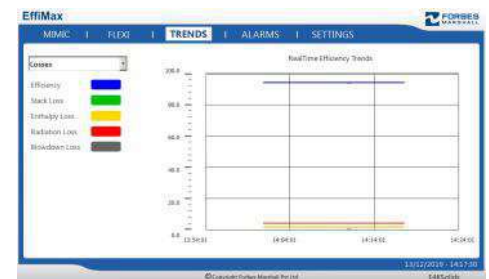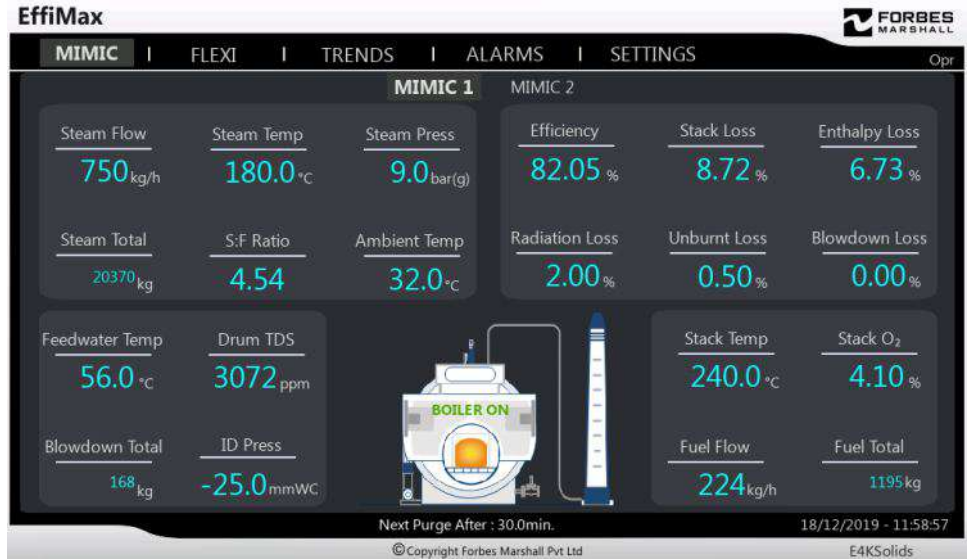
Boilers do not operate at rated efficiency

Surveys reveal that operating efficiency of unmonitored boilers lags behind the rated efficiency by 5-15%

The fuel bill is determined by operating efficiency

Over time, fuel costs are more than those of boilers - many times over!

## EffiMax™ Mimic



The first step towards improving boiler efficiency is to know its current operating efficiency. The Forbes Marshall EffiMax boiler efficiency monitoring system is a proven and complete solution which helps improve boiler efficiency to reduce steam cost.

The analysis of EffiMax reports leads to creating boiler specific standard operating procedures, which not only bridge the efficiency gap but also help sustain it over the entire operating life of a boiler.

## Features

Touch screen display for instantaneous display of all boiler parameters that impact boiler efficiency

Online boiler efficiency measurement with break up of losses (as per BS845)

Graphical analysis of boiler performance metrics

Boiler performance diagnostic reports with alarms

Web based remote performance monitoring

## Measured Parameters

Steam flow
Fuel flow
Steam pressure
Steam temperature
Stack temperature
Ambient temperature
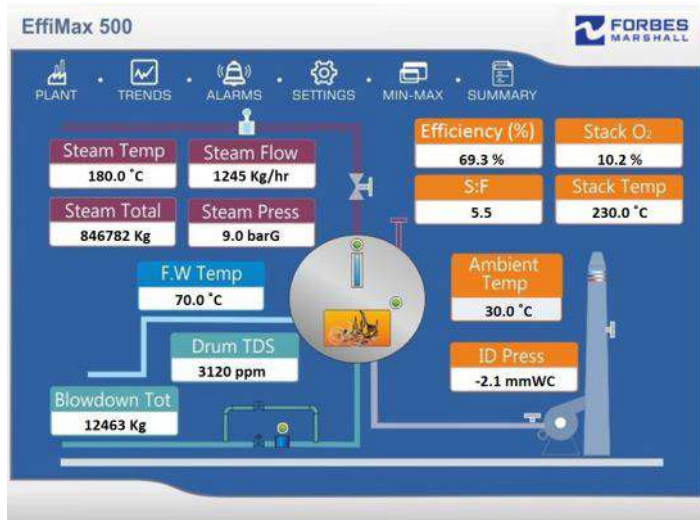Feed water temperature
% $O_2$ in flue gas
Blow down TDS

## Calculated Parameters

Boiler efficiency
Steam to fuel ratio
Stack loss
Blowdown loss
Enthalpy loss
Radiation loss
Blowdown quantity

## Control Parameters for EffiMax 4000

Induced draft
Forced draft
Fuel feeder

**Optional**
Drum level
Water tank level
Deaerator level
Deaerator pressure

## EffiMax™ 500



**EffiMax 500** — FORBES MARSHALL

PLANT · TRENDS · ALARMS · SETTINGS · MIN-MAX · SUMMARY

| | | | |
|---|---|---|---|
| Steam Temp 180.0 °C | Steam Flow 1245 Kg/hr | Efficiency (%) 69.3 % | Stack O₂ 10.2 % |
| Steam Total 846782 Kg | Steam Press 9.0 barG | S:F 5.5 | Stack Temp 230.0 °C |

F.W Temp 70.0 °C

Ambient Temp 30.0 °C

Drum TDS 3120 ppm

ID Press -2.1 mmWC

Blowdown Tot 12463 Kg

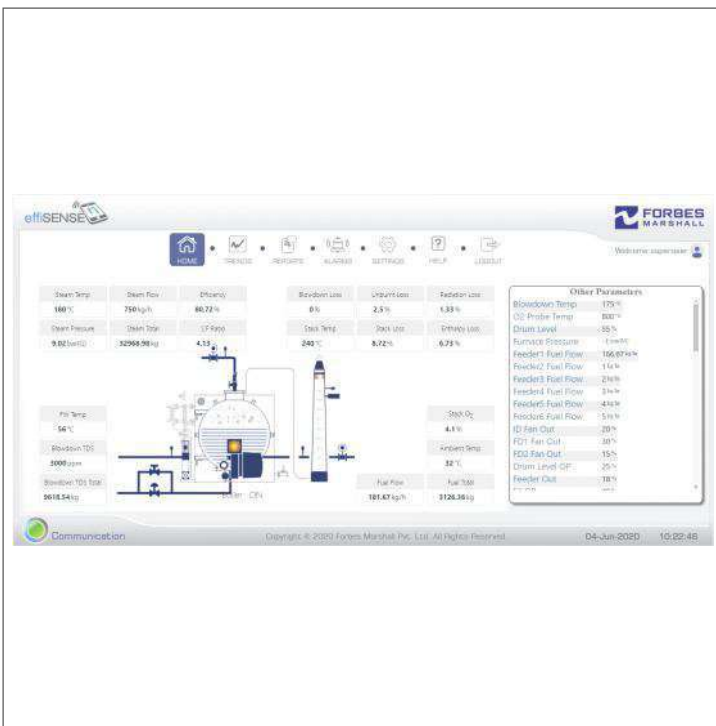⚠ Mobery not drain | ⚠ Check Condensate Recovery | ⚠ Close Boiler Door | ⚠ Poke Fuel Bed

### Benefits
Improved fuel feeding practices
Improved combustion air practices
Improved blowdown practices
Increased operator safety
Indirect efficiency (optional)
Indirect/direct steam to fuel ratio (optional)
ID - FD control (optional)
Feedwater tank level control (optional)
Drum level control (optional)
Data logging
Web connectivity and mobile app

### Intelligent Alerts and Commands
How much fuel to feed?
When to feed fuel?
Close / Open damper
Drain mobrey
Mobrey not drained
Possible back fire
Clean the TDS sensor
Clean the tubes
Improve water quality
Close the feeding door
Stir / poke the bed

## EffiMax™ 3000





- Fuel Bill Reduction
- Sustain Improved Performance
- Identification of Corrective Action in Boiler Operation
- Tuning of Equipment
- Generating SOP for Efficient Boiler Operation
- Establish and Track Key Performance Indices
- Implementation of Corrective Actions

EffiMax 3000 is a cost effective solution to keep a check on the boiler to ensure optimum fuel consumption.
Measures all critical parameters affecting boiler fuel consumption
Calculates the boiler's indirect efficiency and breakup of all losses as per BS845 standards
Calculates indirect steam to fuel ratio
Generates powerful trends, reports, diagnostics, etc. for data analysis
Suitable for any kind of boiler
Web connectivity with mobile app

**EffiMax™ 4000**



**Benefits and Features**

All features of EffiMax 3000 included

Calculates the indirect efficiency of the boiler and breakup of all losses as per BS 845 standards

Calculates direct steam to fuel ratio

ID FD feeder control automation for optimum combustion

Minimum manual intervention

Improved boiler efficiency by reducing stack loss, unburnt loss and blowdown loss

Web connectivity with mobile app

Single / three element drum level control (optional)

Deaerator level control (optional)

**Boiler Peak Performance Service**

A service package to enhance and sustain boiler efficiency

Helps develop an SOP for efficient boiler operation based on EffiMax reports

Regular visits by our engineer to oversee SOP implementation and guidance

## BEESAS
## Boiler Efficiency and Environment



### Benefits and Features

Complete boiler house automation - totally unmanned operation

Includes emission monitoring system like suspended Particulate Matter - SPM, SOx, NOx and CO, etc.

Includes boiler safety alarms and sms alerts

Built on DCS platform with redundant CPU and I/Os with hot-swappable feature

Preventive maintenance scheduling and alert

Lowest downtime, smooth operation and highly safe and efficient operation

Better load management and delivery

Remote connectivity

Full development support

Flexible system configuration

All language support

Guaranteed fuel and electricity savings

## Complete Boiler House Readings at a Glance
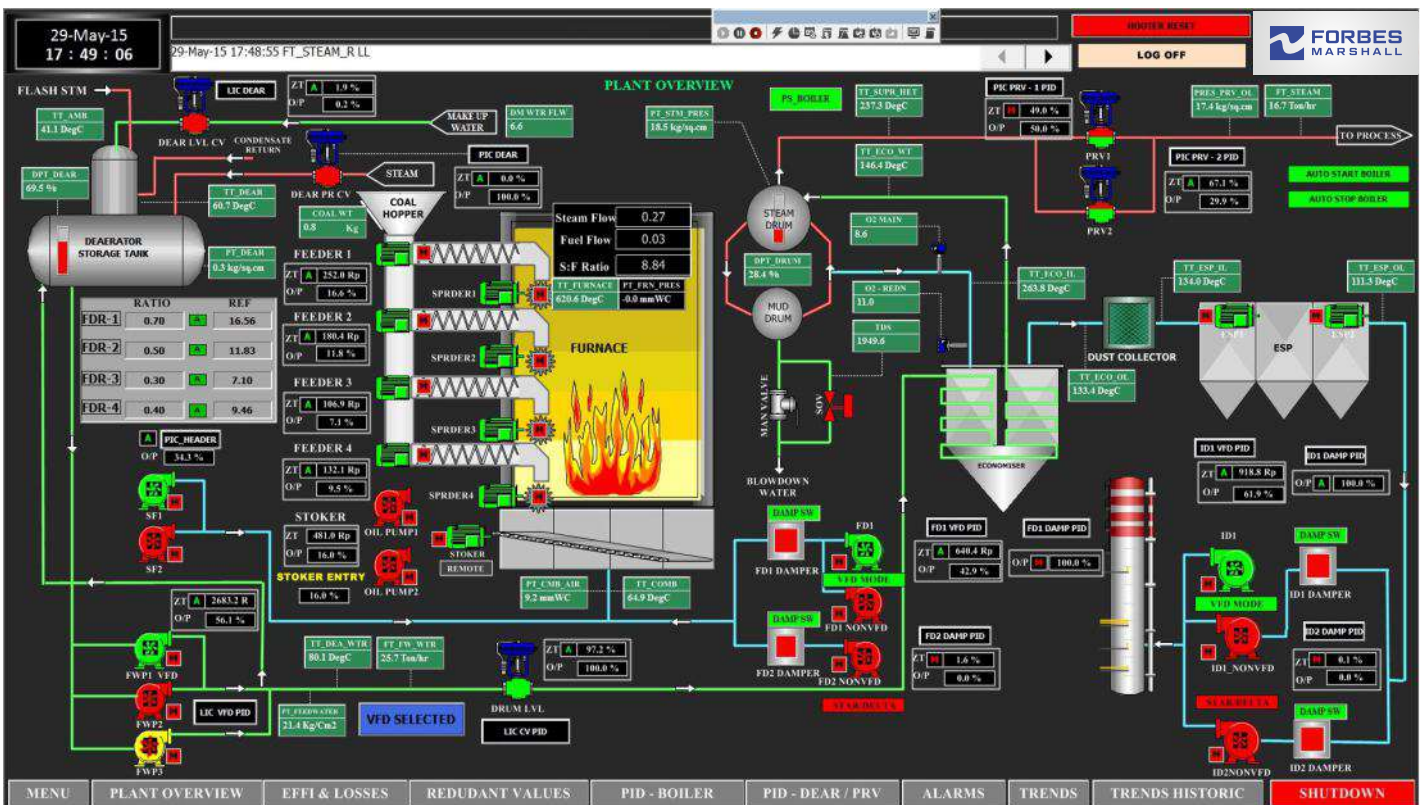
## Payback - Minimum 3% Efficiency Improvement

| Boiler | Coal (Domestic) | | Coal (International) | |
|---|---|---|---|---|
| Capacity (TPH) | Savings(L) (r/ annum) | Payback (Months) | Savings(L) ($ / annum) | Payback (Months) |
| 2 | 4.8 | 22 | 8410 | 29 |
| 3 | 7.2 | 14 | 12615 | 22 |
| 4 | 9.6 | 10 | 16820 | 17 |
| 5 | 12.0 | 8 | 21025 | 13 |
| 10 | 24.0 | 5 | 42050 | 9 |
| 15 | 35.0 | 3 | 63075 | 6 |

## Basis of Calculations

### Coal

Efficiency improvement from 70% to 73%

GCV = 4200 kCal/kg

Cost = ₹ 4500 per ton
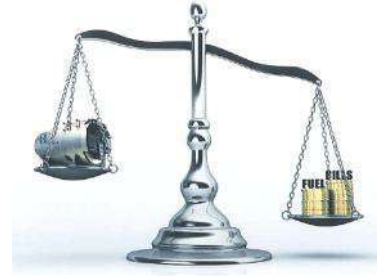


Operating hours per annum = 8000
* The above prices are average prevailing domestic prices

## Innovation Experience

# 70 years

## EffiMax™ Systems

# 1500+

## Global Presence

# 50+
### Offices

## Our Global Presence





**FORBES MARSHALL**

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CIN No.: U28996PN1985PTC037806