

U-ENGINE

Diesel Engine Performance Monitoring System

End User Manual

Utthunga Technologies

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1 Introduction

Diesel Engine Performance Monitoring System monitors and analyzes the Diesel Engine health and & performance in real time. It determines the current condition of the Diesel Engine and gives insights, which helps plant operators to manage and optimize it. The solution provides visibility to key operating parameters and performance KPI's. It determines the KPI deviation from design & alert the customer about deviation. Customer can proactively plan maintenance and reduce unplanned downtime. This user manual is intended to provide all the necessary information to use application.

2 System Architecture

Monitoring Parameters will be collected from the Diesel Engine system itself.

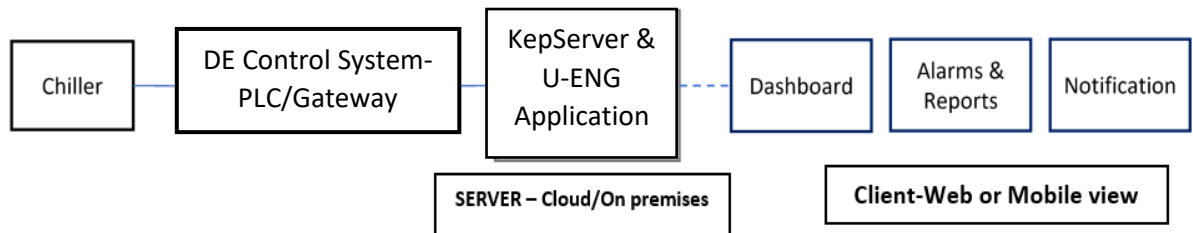


Figure 1: System Architecture

3 Main Page

The Main page of the Diesel Engine Performance Monitoring dashboard displays the Diesel Engine Parameters, KPI Values, Diesel Engine Running Status, Alarm, Trend & Report. Refer to

Figure 2: Home Page



Figure 2: Home Page

The following add on pages are shown in the Homepage:

- Report
- Alarm

3.1 Main Dashboard –Diesel Engine Status

Diesel Engine Running status indicates when the Diesel Engine is ON or OFF. Diesel Engine Capacity varies based on the Compressor Speed. Auto/Manual State shows whether the compressor is running in manual mode or auto mode (by controller).

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Figure 3: Diesel Engine Running Status

3.2 Main Dashboard –Diesel Engine Parameter

The Diesel Engine parameters are coming from the Diesel Engine Device. The values are shown with Units in Value display & Gauges.



Figure 4: Diesel Engine Parameter

3.3 Main Dashboard –Diesel Engine Process Flow Diagram

Process Flow Diagram indicates the process of the Diesel Engine system.

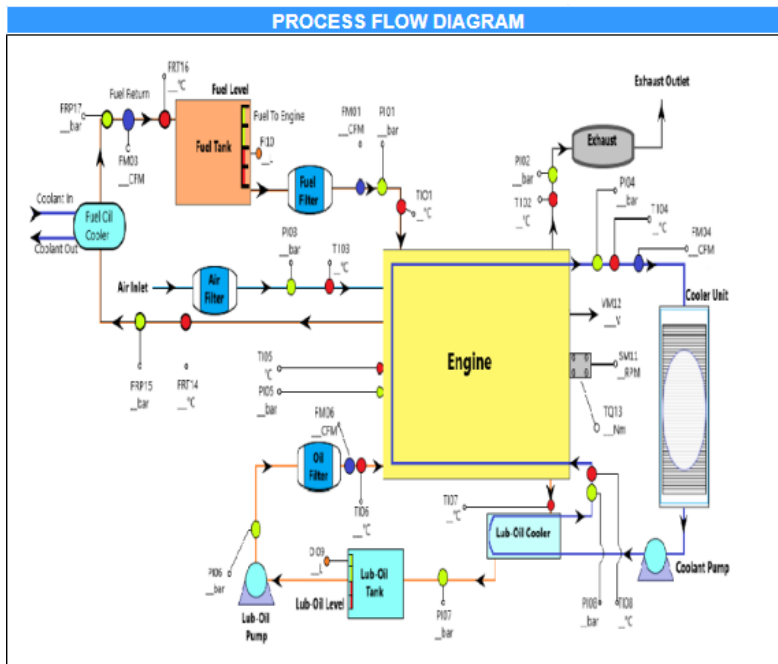


Figure 5: PFD

3.4 Main Dashboard –Diesel Engine KPI

Key Performance Indicators are the calculated values which is calculated from the Diesel Engine parameters.

KEY PERFORMANCE INDICATOR				
Parameters	Units	Design_KPI	Operating_KPI	Deviation_KPI
Fuel Consumption	Kg/Sec	383.0	0.09	99.98
Engine Power Input	KW	4197.68	3986.31	5.04
Engine Power Output	KW	1641.0	1600.65	2.46
Diesel Engine Efficiency	%	50.0	40.15	19.69
Total Losses	KW	177.0	488.00	175.71

Figure 6: KPI

3.5 Main Dashboard –Diesel Engine Alarm

Click ALARM button to see the Latest alarm & historical alarm in the home page. It will open ALARM MONITORING page. The parameter current value, alarm limits, description of the alarm with action points will be displayed in the ALARM MONITORING PAGE for all devices.

To acknowledge the alarm, click the button in ack column.

ALERT MONITORING						
Search:						Export
TimeStamp	Source	Property	AlertType	Description	Priority	Ack
2022-12-01 08:01:05	DieselEngine_1	CoolingSystemFailure	Above	1.Check Lube-oil 2.Check Coolant Level 3.C	1	<input type="checkbox"/>
2022-12-01 08:00:59	DieselEngine_1	Fuel_InjectorFailure	Below	1.Check For Fuel Leakages 2.Check Injecto	1	<input type="checkbox"/>
2022-12-01 08:00:53	DieselEngine_1	FuelInjectorFailure	NotEqualTo	1.Check For Fuel Leakages 2.Check Injecto	1	<input type="checkbox"/>
2022-12-01 07:59:14	DieselEngine_1	PerformanceAnomaly_Fuel_AirSystem_Am	Below	1.Check Fuel Injectors 2.Check Fuel & Air P	1	<input type="checkbox"/>
2022-12-01 07:59:11	DieselEngine_1	high	Above	action points	1	<input type="checkbox"/>
2022-12-01 07:58:11	DieselEngine_1	EngineSpeedFailure	Above	1.Check Fuel Injectors 2.Check Fuel & Air P	1	<input type="checkbox"/>

Alert History				
Search:				Reset
TimeStamp	Source	Property	Description	Priority
2022-12-01 08:01:00	DieselEngine_2	Cooling_System_Failure	1.Check Lube-oil 2.Check Coolant Level 3.Check Coolant Pump (Clean Radiator, Check Fan Speed) If there	1
2022-12-01 07:59:15	DieselEngine_2	PerformanceAnomaly_FuelAirSystem_AnomalyFailure	1.Check Fuel Injectors 2.Check Fuel & Air Pipe Line, Filters & Pump 3. Check ECM, Governor Controller System	1

Figure 7: Alarm Main Page

Configuration of the Alarm:

Click the “Configuration” button (Left top side) to create new alarm.

ALERT MONITORING						
Search:						Export
TimeStamp	Source	Property	AlertType	Description	Priority	Ack
2022-12-01 08:01:05	DieselEngine_1	CoolingSystemFailure	Above	1.Check Lube-oil 2.Check Coolant Level 3.C	1	<input type="checkbox"/>
2022-12-01 08:00:59	DieselEngine_1	Fuel_InjectorFailure	Below	1.Check For Fuel Leakages 2.Check Injecto	1	<input type="checkbox"/>
2022-12-01 08:00:53	DieselEngine_1	FuelInjectorFailure	NotEqualTo	1.Check For Fuel Leakages 2.Check Injecto	1	<input type="checkbox"/>
2022-12-01 07:59:14	DieselEngine_1	PerformanceAnomaly_Fuel_AirSystem_Am	Below	1.Check Fuel Injectors 2.Check Fuel & Air P	1	<input type="checkbox"/>
2022-12-01 07:59:11	DieselEngine_1	high	Above	action points	1	<input type="checkbox"/>
2022-12-01 07:58:11	DieselEngine_1	EngineSpeedFailure	Above	1.Check Fuel Injectors 2.Check Fuel & Air P	1	<input type="checkbox"/>

Alert History				
Search:				Reset
TimeStamp	Source	Property	Description	Priority
2022-12-01 08:01:00	DieselEngine_2	Cooling_System_Failure	1.Check Lube-oil 2.Check Coolant Level 3.Check Coolant Pump (Clean Radiator, Check Fan Speed) If there	1
2022-12-01 07:59:15	DieselEngine_2	PerformanceAnomaly_FuelAirSystem_AnomalyFailure	1.Check Fuel Injectors 2.Check Fuel & Air Pipe Line, Filters & Pump 3. Check ECM, Governor Controller System	1

Figure 8: Alarm Configuration Link

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The configuration pop up will open after clicking the configuration button. New alarm can be created here by adding all the information required. Once add all the information, click the add button. The new alarm will be added in the background. When the alarm limits (High or Low) reach, you can see the alarm in Alarm Summary table.

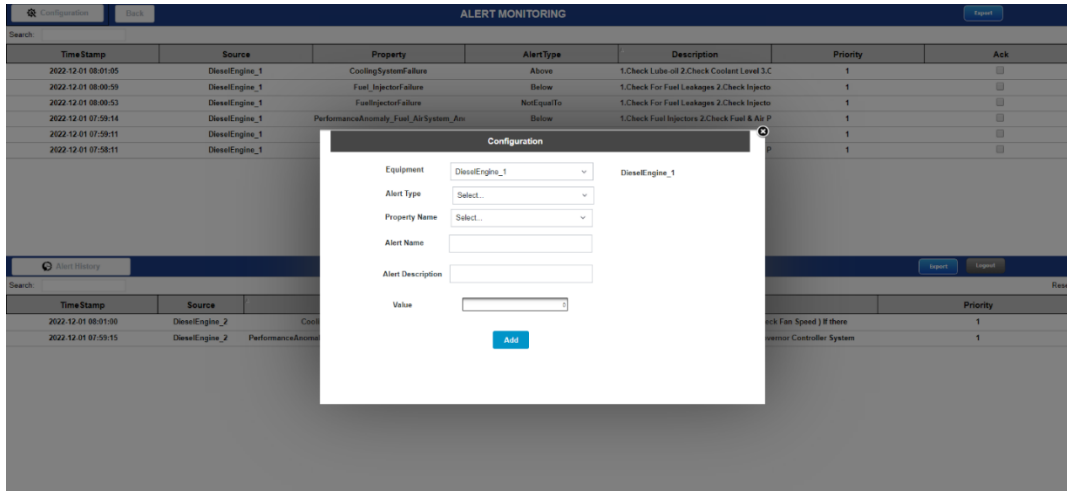


Figure 9: Alarm Configuration Popup

3.6 Main Dashboard –Diesel Engine Trend

The TREND can be seen in the Home Page, Separate Trend for different parameters is available here. Example: Engine speed, Engine temperature, Fuel inlet flow rate, Fuel return flow rate, Torque. All Parameters can be seen in “ALL” tab. Click the back button to go to the home page

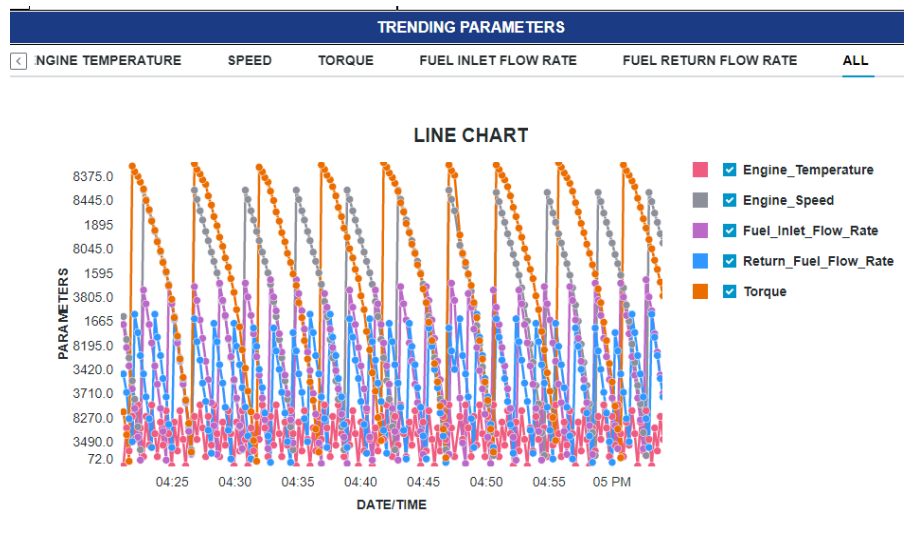


Figure 10: TREND

3.7 Main Dashboard –Diesel Engine Report

Diesel Engine report is available by clicking the REPORT button.



Figure 11: Report Link

“From” & “To” date has to be given to get the report of the parameters. Customer can download excel sheet by clicking the “EXPORT” Button. Click the back button to go to the home page

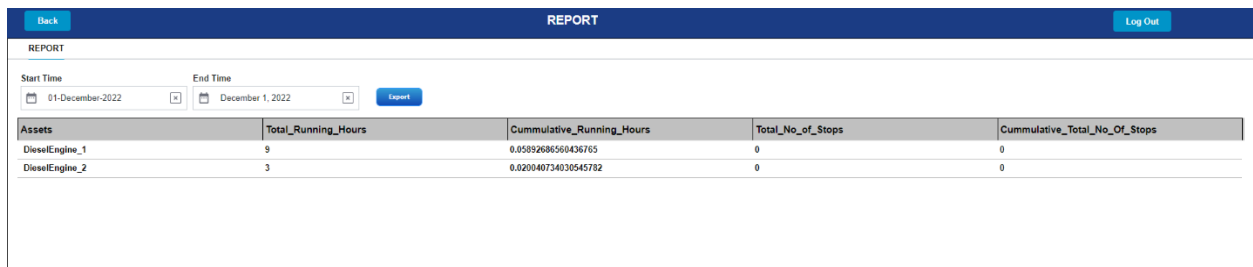


Figure 12: REPORT in Separate Page

4 Support



+91 80 6815 1900



contact@utthunga.com



www.utthunga.com



Utthunga Technologies Pvt Ltd

No.8, 27th Cross Road, Banashankari
2nd Stage, Bengaluru, Karnataka - 560070

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