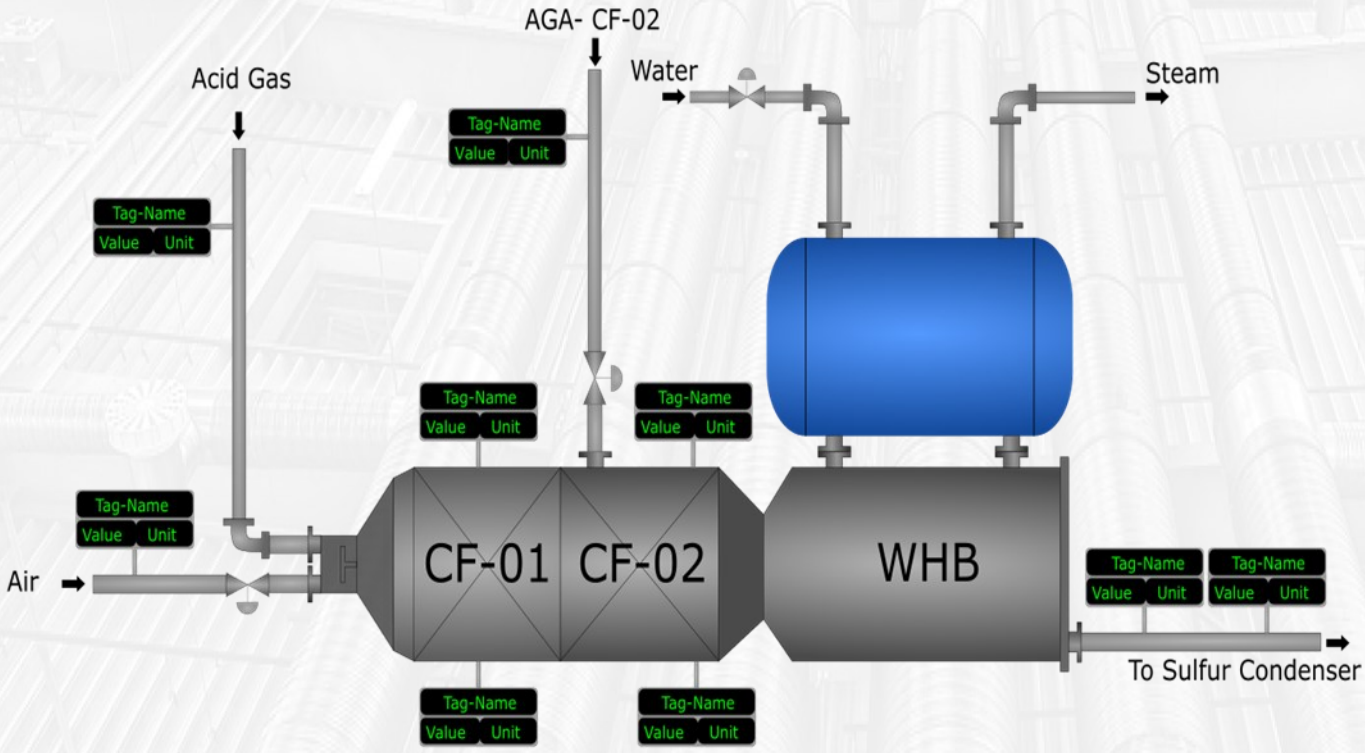
MCL CONTROL

Sentinel



TailGasVASentinel™

www.mclcontrol.com

2021

INTRODUCTION

The Claus Process basically consists of transforming hydrogen sulfide (H2S) (highly toxic) into sulfur, water, and thermal energy.

Its main objective is to recover the sulfur contained in the (H2S) mainly from the streams of acid gases stripped of regenerated liquids, such as; alkanoline solutions or physical solvents used in the purification of acid gases in refineries.

To achieve maximum sulfur recovery, a ratio H2S/SO2 is typically maintained in the tail gas at a value of two (2). The control system requires having the molar composition of H2S and SO2 to calculate this ratio and consequently determine the air demand.

Using Tail Gas Virtual Analyzer Sentinel (**TailGasVASentinel**) our customers can be sure that they operate optimally and comply with environmental regulations

DESCRIPTION

TailGasVASentinel is a system of analysis of the composition of H2S and SO2 and the determination of the demand for air, in the tail gas or residual gas of a Claus plant, these are algorithms that allow to infer in real time the unavailable composition measurements of a dynamic system from the available measurements of pressure, temperature and flow. The system contains a retraining algorithm that provides the plant operator with the ability to machine learning using the history of the process.

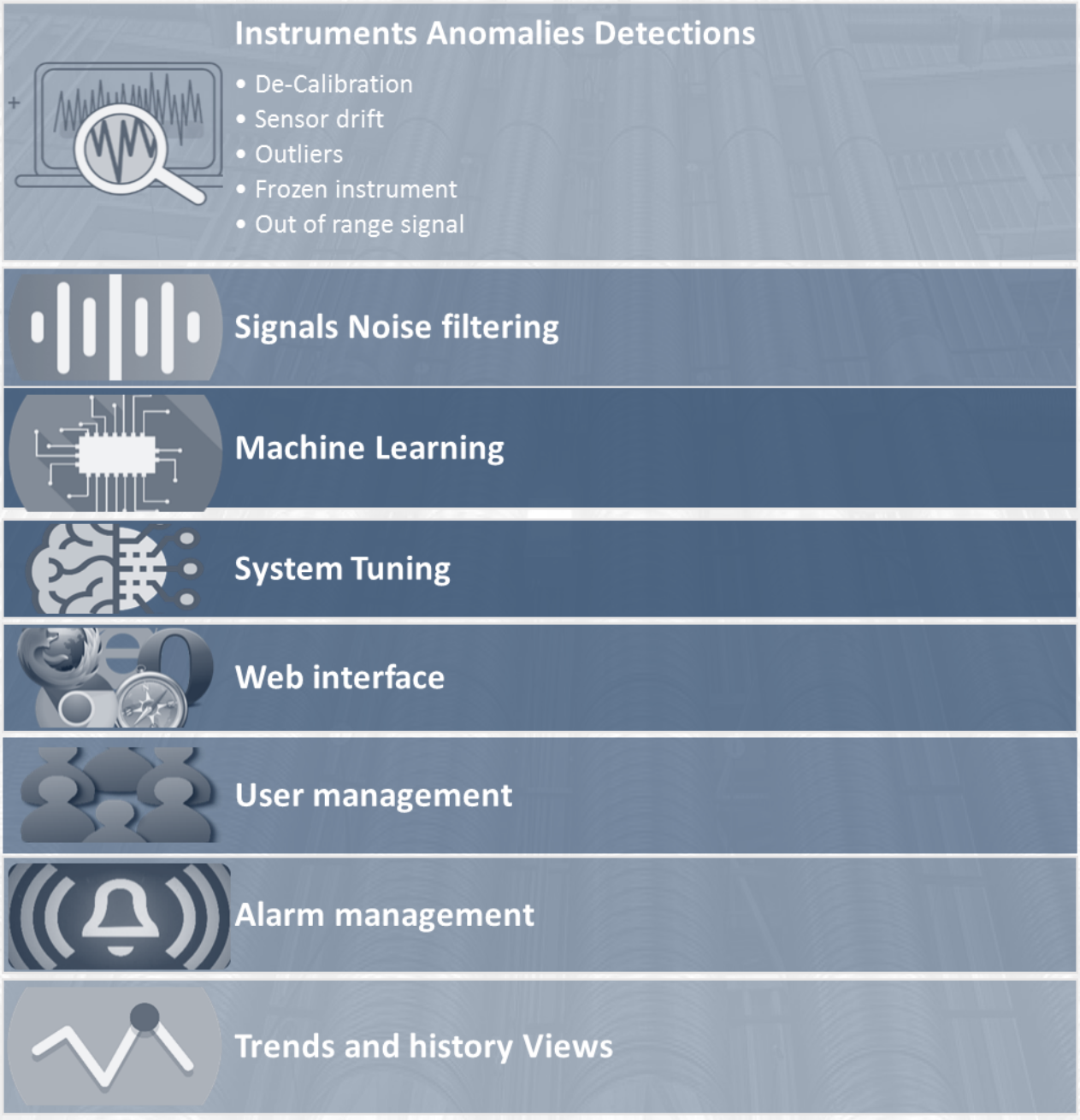
TailGasVASentinel is based on a model of the plant, with which you can infer the compositions of H2S and SO2, and additionally to determine the air demand. If the Claus plant and its model are subjected to the same stimuli (the same inputs), their responses, consisting of measurable redundant variables and unavailable compositions, will behave in the same way. Therefore, the latter, and the calculation of air demand, can be used as the actual values of the plant.

BENEFITS

1. Easy to use: It can be easily used by the plant operator, due to its intuitive environment, which does not require large investment in training.
2. Availability: It has an availability of 99.66%, considering that spare equipment with a 24-hour MTTR is available.
3. Simple and fast calibration: **TailGasVASentinel** has self-diagnosis, monitoring its performance automatically to indicate to the operator when calibration is necessary, outside the time agreed in the maintenance contract between both parties.
4. Few resources for calibration requirement: The calibration process is performed with plant history and uses redundant variables for calibration, so it does not require standard gas samples and /or laboratory resources used in typical plant sampling and control procedures.
5. Reduction of maintenance costs: Its implementation is done on a standard PC, which in general requires low maintenance costs when compared to any other industrial hardware.
6. Increase in the cost-benefit ratio: Through **TailGasVASentinel** the operator will have available the composition of H2S, SO2 and the air demand, which will allow it to maintain the process near its optimum point of operation with a greater recovery of sulfur, optimizing the energy resources of your plant and reducing environmental emissions.

FUNCTIONALITIES

TailGasVASentinel not only infers the tail gas composition and determines air demand, but has other functionalities, detailed below:



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ARCHITECTURE

TailGasVASentinel is a system based on the client-server architecture, as can be seen in Figure No. 1, which allows to monitor the performance of a Claus Plant depending on the H2S/SO2 ratio, and the Air Demand, in the tail gas of the process, from any computer connected to the client's internal network, through the HTTP - OPC UA Protocols.

Its data acquisition system is based on OPC UA industrial protocol and has its own SQL database for the operation variables necessary for the correct functioning of the system.

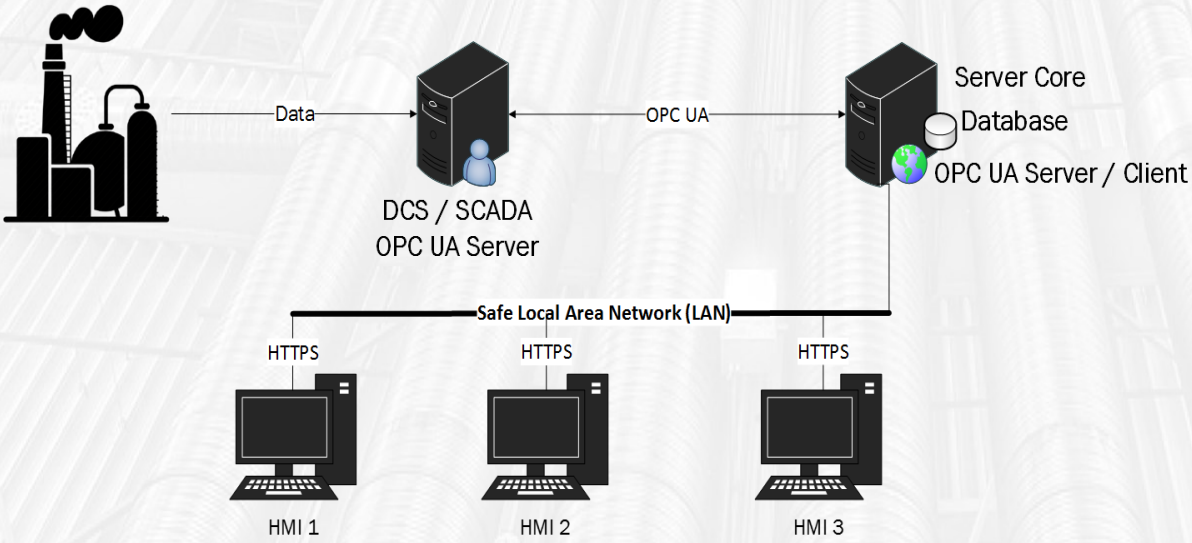

Figure N° 1.– Architectue **TailGasVASentinel**

HUMAN-MACHINE INTERFACE:

TailGasVASentinel has a modern web interface to show the performance of the system, real-time trends, alarm and event management, operation schematics, operation reports, among others.

TailGasVASentinel also has an OPC-UA Server.

Figure N° 2.– Images of the Human-Machine interface of the **TailGasVASentinel**

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