Browser based 3D SCADA

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Introduction

For an efficient process plant control PLC/ DCS and SCADA interface are very much required. Automation OEM such as Siemens and Schneider provide SCADA systems. Proposed SCADA is designed to work just as the normal SCADA with additional features such as 3D interface, all time availability, portability. This SCADA is accessible through regular web browsers such as Firefox, Chrome, etc and the plant data are available remotely. Though prominent automation OEM such as Siemens and Schneider have browser based interface, they are not fully portable and constrained to a closed network.

S. No	Conventional SCADA	Proposed SCADA
1	2D or image based interface	Complete 3D interface
2	Available in fixed standalone PC	Available through internet in all web browsers as well as offline in standalone PC
3	Need third party tools or additional tools to migrate to Industry 4.0 technology	Ready compatible for Industry 4.0

Fig.1 Conventional SCADA on left and Proposed browser based SCADA on right.

Functionalities

Browser SCADA will be hosted in web server along with database. The SCADA interface and the database can only be accessed with proper authentication. As the SCADA have a 3D interface identification of the equipments and instrument will be easy and, error or alarm rectifications will be quick.

The interface consist of four major parts. First is the navigation pane on the left, this portion have selection buttons for instruments and equipments which we desire to monitor. Second the display area, where the 3D model is displayed. The 3D model display can be panned, rotated and zoomed as we wish. When reset is selected the position resets so that complete plant will be displayed. On selection, particular instrument will be displayed.

To navigate the model we can use the pan, rotate and zoom options. To pan the model left click and drag. To rotate the model, click middle mouse wheel and drag. Moving the mouse wheel forward and backward will zoom in and zoom out the model.

Third and fourth portion of the screen comprises of the faceplate details of the selected instrument and trend or graph respectively. The face plate covers the tag numbers, service, description and operating range. Trends are live values of the instrument.

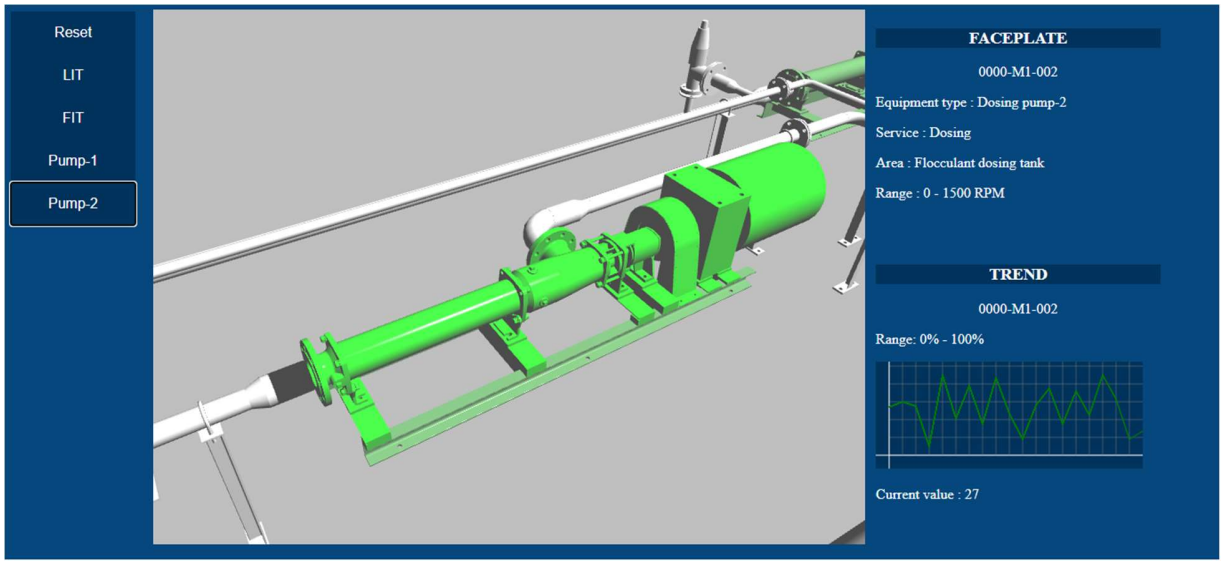

Fig.2 Flow meter selection showing the faceplate and respective trend.

Requirements

The SCADA system is hosted in internet, hence strong cyber-security in mandatory. The web pages and database should be hosted in a protected server. A data logging program needs to be done in the plant PC. The data logging program can be done through OEM SCADA program or an offline version of the browser SCADA.

Roadmap

This browser based 3D SCADA is partially done and still under development. With the current version the 3D model can be displayed, data can be logged and the logged data can be seen. Still color change on selection and easy offline development platform are being done. There is an idea to port this 3D SCADA to windows based runtime apart from browser based. Implementing cloud analytics of the collected data is on paper.

Analyzing the collected data will produce very informative results. Analytics can be prepared for maintenance reports and Utility/ power consumption reports.