

## Introduction:

Modern manufacturing complexity requires automation systems to boost productivity and efficiency. HMI is one of key software tools that help manufactures to achieve those goals. A Human-Machine Interface (HMI) is a user interface or dashboard that connects a person to a machine or device. HMI is most commonly used in the context of an industrial process. In industrial settings, HMIs can be used to visually display data, track production time, trends, and tags, oversee KPIs, and monitor machine inputs and outputs. A plant-floor operator might use an HMI to check and control the temperature of an industrial oven, or to monitor see if a certain pump in the facility is currently running. This can include extensive monitoring dashboards for manufacturing areas in a plant floor.



## Problem: Total Cost of Ownership is increasing as manufacturing capacity growing

Traditional HMIs have been solutions developed for local use only. This means that in order to control or monitor parameters on a plant asset, the individual needs to be physically present at the machine where the HMI is deployed. Manufactures need to put lots of manpower and resource to manage and maintain each individual HMI stations located across the plant floors. As business growing, manufacturing capacity expanding and the number of HMI station growing, the cost of managing and maintaining all HMI stations are getting unbearable.



## Solutions Overview, Benefits and Advantages

The most common technologies widely deployed, Web-Based and RDS-Session-Based HMI Remote Desktop Services and Web Based HMI on the plant floors are playing a major role of reducing the total cost of ownership of each HMI station. Easy installation and low maintenance are two major benefits that manufactures can gain by deploying Remote Desktop Services and Web Based SCADA/HMI on the plant floors. The HMI software resides on server and Thin Client and Web Client is Operating System independent, deployment and replacement can be quick and easy involves no software installation required.



## Technical Details about Web-Based and RDS Session-Based HMI

The Web-Based HMI mainly utilizes open standards for HTML5, JavaScript, and CSS. It is compatible with all browsers including: Chrome, Firefox, Safari, Internet Explorer, Mobile Safari and Chrome on iOS, Mobile browsers on Android. on Mac, PC, Linux. It can be displayed on a mobile device which is capable of displaying HTML5 and executing JavaScript and makes mobile HMI possible.

Session-Based HMI utilizes Remote Desktop Services (RDS) offered in Microsoft Windows Server. This technology fundamentally allows multiple users to access different applications, data, and virtual desktops located on a centralized server. RDS is a cost-effective method of deploying HMI apps to a HMI station that allows users to remotely access applications and data that are assigned to the operator and station. It also centrally controls which remote desktop hosts can be accessed, who can specifically access them, and even device redirection.



## Conclusion

The hardware for HMI station on the production floor is as most important HMI software. It is crucial to have an Industrial Thin Client / Web Client computers to be able to place on the production floor and meeting environmental protection requirements on every stage of manufacturing process and in every industry sectors. The environmental protection requirements may not be the same in every industry and each stage of manufacturing process.

The Thin Client to be used in Class 1 Division 2 hazardous area where the existence of flammable gases or vapors and/or combustible dust may be a presence in the air during an abnormal occurrence which needs to be certified. The industrial thin client computers in pharmaceutical industrial requires meeting IP66 environmental protection and to be able to withstand cleaning solutions. For example, mobile workstations are constructed by stainless steel 316L materials, specifically for pharmaceutical manufacturing clean rooms. Generally, 316 steel is specified for environments with strict cleanliness requirements, or when equipment is exposed to harsh chemical cleaners and corrosive environments that 304 stainless steel cannot withstand. 316L offers increased protection against salt, proteins, and strong acids or bases. 316L possesses enhanced resistance to chlorides and chlorinated solutions that are common in controlled environments and cleanrooms, such as Spor-Klenz® and Isopropyl Acetate. A Thin Client / Web Client computer with proper environmental protection design can be very beneficial to the manufactures in the long run.



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