

EXTRACTION SYSTEM AUTOMATION

Process Overview

Extraction (liquid-liquid) is widely used in the bulk drug industry where other types of separation techniques like distillation; crystallization fails to suit the application. Liquid-liquid extraction is a process for separating components in solution by their distribution between two **immiscible liquid phases**. The solvent is chosen so that the solute in the solution **has more affinity toward the added solvent**. The extraction solvent phase leaving a liquid- liquid contractor is called **extract**. The **raffinate** is the liquid phase left from the feed after being contacted by the second phase. Types of Extraction feed & Solvent added are **Cross-Current Extraction, Counter-Current**

Need For Automation

The **extraction process** demands for the **controlled and proportional addition of feed and solvent**. The same is difficult to be established manually. The extraction process involves various intermediate stages (**Mixer-Settler**) before the collection of extract from feed. During these stages at each stage the **mass level** in the tanks and volume of mass transferred from one tank to another. The pump at each stage to pump the liquid from one tank to another requires manpower to monitor the **level in the tank** and then **start/ stop the pump**. The manual controlling for above stated process involves **criticality**, in case of inattention might result in overflow of tanks, dry running of pumps etc., The manual monitoring or controlling of extraction process is highly critical and in case of any inattention results in **batch failure, consuming power, feed, solvents** etc.,

In these stages the automation of the process is needed to make the **efficient utilization of resources** like feed and solvent and to avoid the process from manual errors.

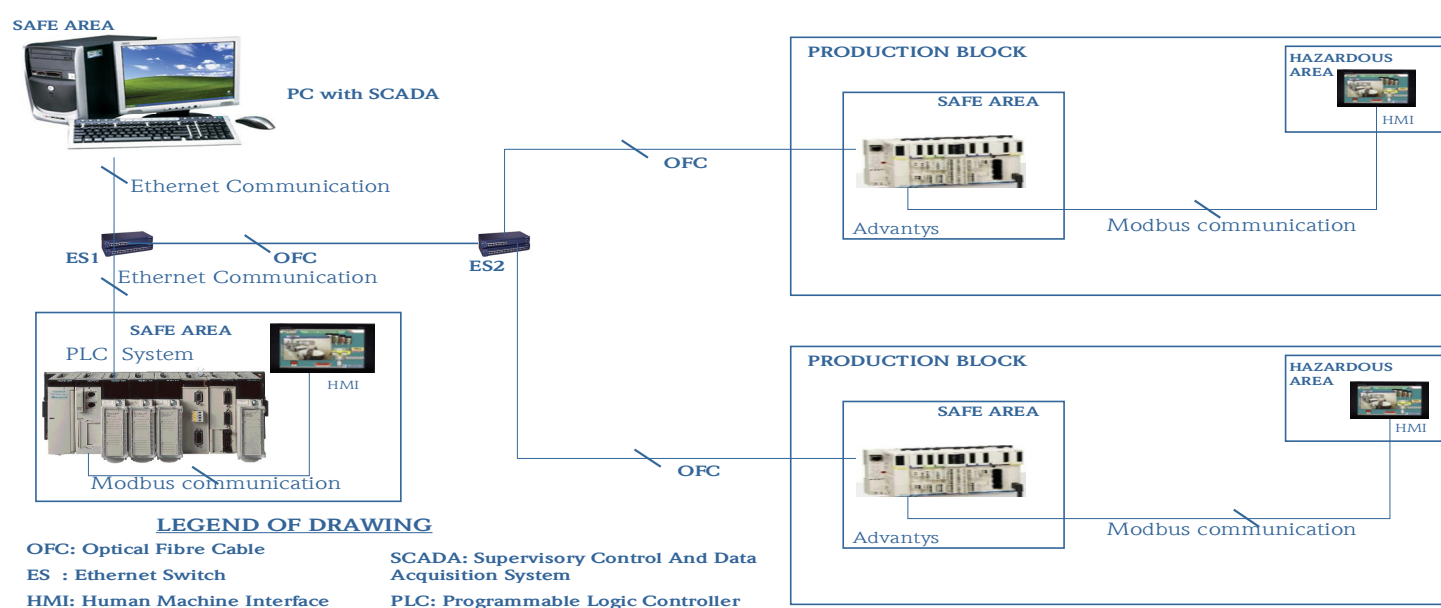
System Components Control System (Software- Hardware) HMI, SCADA

A **control system** with Open architecture design provides complete flexibility, high performance & ease of operation to the end user. The high-performance processor is considered which is capable of multi-tasking, best memory management & high reliable. **Remote I/O modules** for far spread blocks, **HMI's** at various production blocks for ease of operation. Remote process monitoring is performed by **SCADA** and various management information reports.

The system uses advanced software tools and components to build the necessary logic for better process controlling and process. The software includes features like Graphics, Trending, History and reports on customized formats.

An **internal FAT** will be conducted on the Panel Engineered & simulation test will be conducted at our in-house to analysis right logic & controlling developed in the system to ensure stringent control.

System Architecture



System Components Field Instruments (Sensors, Transmitters, Control Elements)

The better controlling needs effective sensors to read the process, transmitters to send the read parameters to control system, better logic to address and best control element to execute. The hooters & annunciators, alarms on process deviation. The precise controlling enhances the accuracy of the system. The performance of the system is dependant on the Instruments.

The field instruments used in the projects is from **POLMON manufactured** instruments or **from the reputed manufactures**. The instruments used are **tested at our in-house** and sent to end-user after checking to ensure product quality.

System Benefits

- Efficient mass interaction between solvent and feed, efficient solvent recovery
- Maximum utilization of power
- Improves accuracy of the system
- Consumption of the resource is monitored at each stage
- Greatly reduces manual interventions
- Reports various MIS reports
 - Solvent consumption report
- Operation cost analysis report
 - Graph against feed and material recovered

More Information

For more information on POLMON solutions, contact your POLMON account manager

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