**Comparison table between PLC, DCS, and SCADA?**

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|  | **PLC** | **DCS** | **SCADA** |
| **Functions** | Single process control | Entire plant control | Provides communication between equipment in a plant |
| **Speed** | Faster than DCS & SCADA | Faster than SCADA | Slower than DCS |
| **Networking** | Engineered networking as per requirements | All the components are tightly integrated into the network | All the components are tightly integrated into the network |
| **Communication** | Doesn’t have a wide range of communication | Wide range of communication | Wide range of communication |
| **Margin for error** | Only one device controls the process so there is a chance for error | There are many controllers so less margin for error | Less margin for error |
| **Pricing** | Low cost | High initial cost | High initial cost |
| **Major brands** | Allen Bradley, Texas Instruments, Omron, etc. | Honeywell, Yokogawa, Siemens, etc. | Allen Bradley, Siemens, MODICON etc. |
| **Monitoring range** | Short distance (single process) | Entire plant | Long-distance monitoring |
| **System composition** | Hardware | Hardware, Visualizing software, and historian | No hardware, Data collection, and monitoring |
| **Flexibility** | Highly flexible | Due to the complex architecture, it is not flexible as PLC | Due to the complex architecture, it is not flexible as PLC |
| **Process changes** | It can handle process changes | Due to the complexity, it won’t be able to handle the process change | Due to the complexity, it won’t be able to handle the process change |
| **Applications** | Used for dedicated applications | Used for complex applications | Used in big industries (Remote monitoring) |

Use case:

PLC – Controller

DCS – Controller + Network + Software + I/O Acquisition

SCADA–Data collection + System monitoring + Network + Software

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|  | **SCADA** | **DCS** |
| **Geographic span** | Large- cross country | Small |
| **Data acquisition rates** | Moderate seconds to a minute | Very fast milliseconds to seconds |
| **Data acquisition network** | Slow with a moderate error rate | Fast with a low error rate |
| **Graphic user interface** | Basic | Full-featured |
| **Alarming subsystem** | Basic | Full-featured |
| **Control actions** | Human initiated | Programmatically initiated |
| **Operation method** | Data gathering oriented | Process-oriented |
| **Process controlling** | SCADA would only collect details from the field and transmits them to the controller | DCS would control the process through H/W such as AI, AO, DI, & DO |

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|  | **PLC** | **DCS** |
| **Process type** | Discrete operation handling input in binary. (\*Advance PLCs can process analog signals as well) | DCS would control analog as well as digital signals |
| **Response time** | Faster than DCS | DCS is comparatively slower than PLC |
| **Scalability** | PLC can only handle a few I/Os, due to this PLC is used for small scale equipment | DCS is capable to handle several thousand I/O’s and due to this DCS can handle a large process(entire plant) |
| **Redundancy** | Can have Redundant configuration | Can have Redundant configuration |
| **Programming** | Ladder logic, STL, Functional block diagram, etc | In DCS functional block programming is used |
| **Hardware package** | HMI and other software would be required to handle the networking and communication | DCS is composed of HMI and software which would be useful for communication and networking |