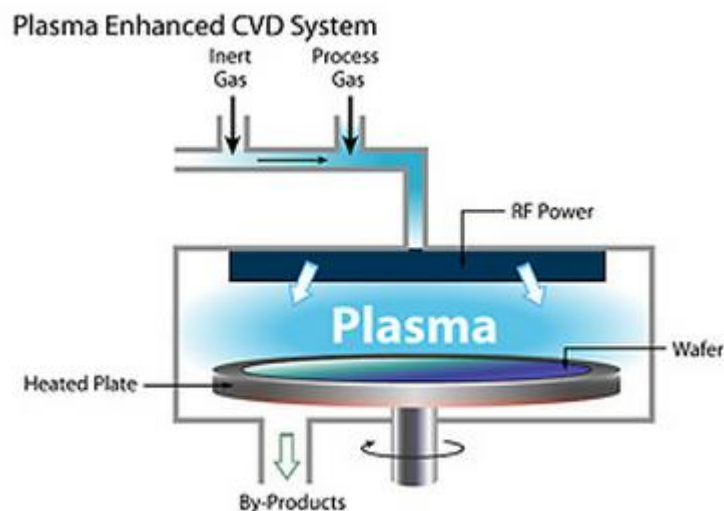


## The semiconductor CVD machine shows the DeviceNet monitor application

As the semiconductor technology improves every day, process yield requirements are also rising for the large number of electronic products. Therefore, the production capacity and yield control become more important in each semiconductor production process. In the semiconductor manufacturing process, the thin-film process is more complex and more particles. The main process equipment of the thin-film process is "Chemical Vapor Deposition" (CVD) machine which can often be seen on TV with the robot arm holding a wafer and feeding into chamber. That is the operation of the CVD machine.



The thin film will be grown on the wafer in the CVD chamber by the silicon, silicon dioxide or other metal materials. These materials are

not only attached to the wafer, but also are attached to the inner wall of the chamber. For a long time, the inner wall will accumulate a grate amount of particles in the chamber. Those particles would affect the yield of the wafer. Due to the CVD machine operates automatically in a sealed room, the production stability should highly be monitored and controlled. Applying a steady and rapid monitoring system become the future trend.

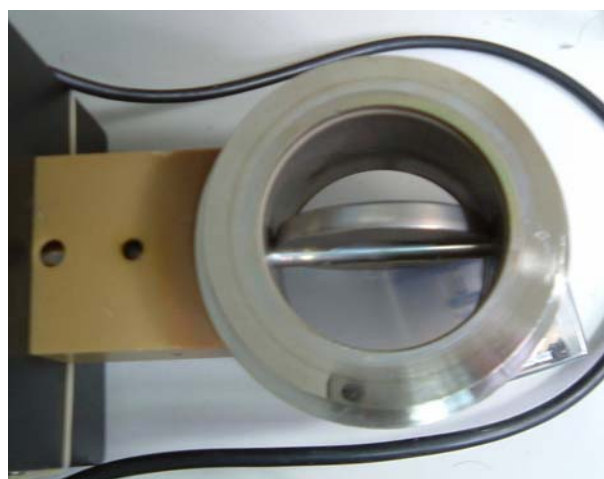


DeviceNet is a cost effective solution to one kind application of control area network. It reduces the connection wires between devices

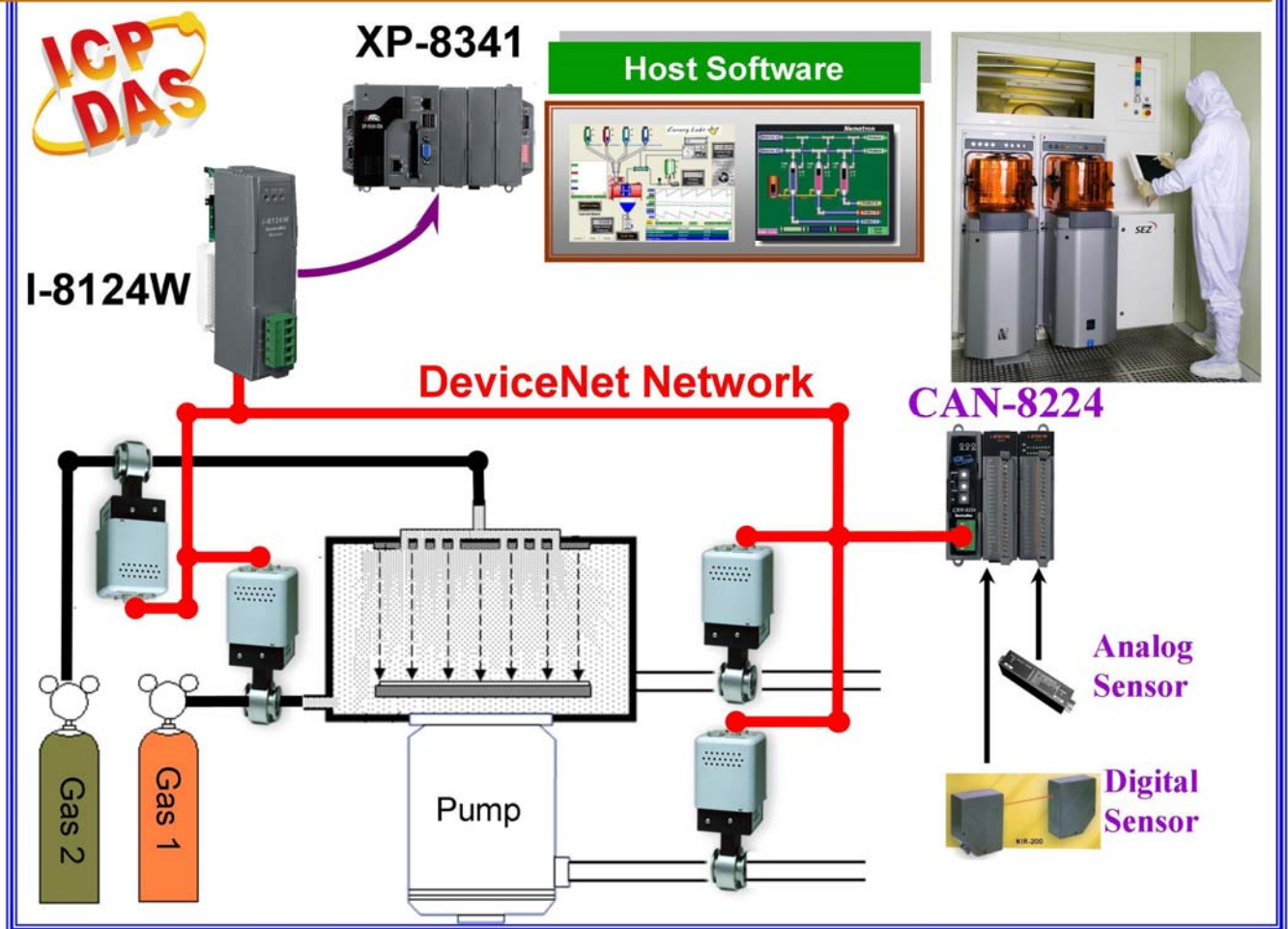
and provides rapid troubleshooting function. This system utilizes XP-8341 and I-8124W as the controlling center of the remote I/O devices. The I-8124W provides DeviceNet master engine to collect the remote I/O data, including pneumatic valve “MKS 683” and Beckhoff DeviceNet I/O. XP-8341 exists an operating program to control the situation in the chamber. It is important to control the reacting time of the wafer in the chamber which have some kind of gas inside. After tuning timing and pressure parameter, this series equipment has been developed successfully and works in some semiconductor factories.

#### System Architecture:

- \* The I-8124W is DeviceNet master.
- \* DeviceNet slave #1 : Beckhoff PLC
- \* DeviceNet slave #2 : CAN-8124
- \* DeviceNet slave #3 : MKS 683
- \* Other slaves are sensors and I/O channels.



## CVD/PECVD Semiconductor Machine



Feature:

1. DeviceNet is kind of industrial network solution with simplicity and safety.
2. Reduce wire connection and the complexity of the network.
3. Monitoring the real-time yield rate and production.
4. Reduce the time and the cost of monitoring.
5. Raising the stability of the system.
6. More flexibility of the system.